

AMERICAN NEUROLOGICAL ASSOCIATION.

NINTH ANNUAL MEETING.

First day, afternoon session.

The American Neurological Association convened at the New York Academy of Medicine, June 20, 1883. Dr. WILLIAM A. HAMMOND, of New York, the retiring President, called the Association to order at 2:30 P.M., and, after the following remarks, introduced the President-elect—Dr. Robert T. Edes, of Boston.

Present—Drs. Edes, W. A. Hammond, Mills, Morton, Webber, Dana, Putnam, Gibney, Shaw, Birdsall, G. M. Hammond, Amidon, Spitzka, and Ott.

Dr. HAMMOND said he had nothing special to remark with reference to the work of the Association at its last meeting, except to call attention to the fact that the papers read seemed to have attracted wide attention; for, at least half a dozen of them had been translated into almost every language in Europe, either wholly or in part. It seemed to him that there is a growing interest in neurological science, yet not so much, perhaps, as the subject deserves.

He hoped that the proceedings of the meeting might be as decisive, with reference to the prosperity of the Society, as were those by which it had been preceded. Dr. Hammond thanked the Association for the honor conferred upon him in electing him their presiding officer last year, and then introduced the President-elect, saying he had no doubt that Dr. Edes would receive fully as much consideration as had been extended to him, and would probably give

rise to a series of better meetings than those over which he had had the honor to preside.

PRESIDENT'S ADDRESS.

Gentlemen: I should have hardly felt willing to accept the office of President if I did not feel that it was tendered as a compliment to a senior member of the Association, for certainly some of the gentlemen, by reason of their scientific attainments, deserved the honor much more than I did. The notification from the Secretary that an address would be expected from the President, was received by me with a certain amount of misgiving, and my engagements have been such as have not permitted me to review the literature of our specialty in a way to enable me to prepare an address appropriate for the occasion. I think, however, that if I was compelled to select a single word which would include the progress which has been made of late years in neurology, that word would be "localization." Thanks to greater knowledge of anatomy and improved methods, we are constantly learning more and more of the seat of disease. We see where the blow has struck, but it is worth our while to consider how important is the knowledge which is so greatly lacking, or so merely speculative as to its nature and origin, and how essential it is that correct views should prevail as to early symptoms.

Two opposite views prevail in two classes of mind, as to the significance of symptoms which have not become thoroughly decisive.

One set of men, who may be found especially among the therapists, are prone to consider every recovery, after symptoms which are more or less allied to those found in the serious organic diseases, as cures, and such they may very fairly be called in some cases.

The error consists not in recognizing the beneficial effects of the treatment, but in not perceiving that disorders which are at the beginning functional, or hardly more than such, may turn either toward recovery or toward the establishment of organic lesions.

The word "functional," I know, is looked at a little

askance by the micro-pathologist, and justly so, for the more diseases we can remove from that category the better; but it must serve for a time to cover our ignorance of those processes which are pathological, but not, so far as our present knowledge goes, anatomical.

That changes unappreciable by anatomy may be the most dangerous, is proved by the existence of epilepsy, of fatal syncope, of shock, by the obscurity of the cause of so-called uræmia, and by the action of so many poisons, acute and chronic, which present absolutely nothing that is distinctive to the anatomist, and only occasionally to the chemist.

The other error accordingly is of the anatomist, who looks at all diseases in the light thrown backward from the autopsy, and who is apt to think of a lesion as existing from the beginning, and of recovery (?) from serious symptoms, not as a triumph of therapeutics, but as a mistake in diagnosis.

Both classes of minds are necessary to the progress of neurology, as of other branches of medicine, and both require for their correction that most important piece of apparatus without which no physiological laboratory, no matter how elaborate its fixtures, is of real value,—what is vulgarly known as the level head.

I know that these remarks are mere commonplace, but the errors are for all that deep-seated and common, and we see them running through neurological, perhaps more largely than through general medical, literature, and hear them quite as often as we read them.

How far can they be avoided? Not absolutely, it is evident.

Individual feeling will still dictate our stories of cure, and nature will still be thrust *more or less* into the background by the sanguine and the sceptical.

Progress in physiology and pathology,—and by these I do not mean merely pathological anatomy, but the science of life, normal and morbid,—must be founded on experiment, on anatomy, on chemistry (too much neglected in this point of view), on minute physics, and on clinical observations.

This science, in the department of neurology, is limited in practice, it is true, but really almost co-extensive with medicine; and we are to help to build it up. And one of the advantages of such an Association as ours is that it brings into contact, perhaps into collision, different classes of minds, different local views, which may mutually correct each other, that the enthusiast may be restrained and the sceptic encouraged.

One of the first thoughts in all our minds to-day must be the losses which the meeting of to-day has sustained in the absence of our Secretary, who has done so much, not only of the scientific, which was his delight and our profit, and whom we hope another year will return to us, and in the death of one with whom many of us often differed, but whose laborious investigations and suggestive writings have added so much to our interest and instruction. After these vague generalities, for which the gentlemen who prepared the card are quite as much responsible as myself, let us proceed to more exact and profitable labors.

The next order of business was the reading of the minutes of the last annual meeting. Dr. HAMMOND moved that as they had been published, the reading of the minutes be dispensed with. Carried.

The President called for the report of the Council, and Dr. HAMMOND, the only member present, remarked that there had been no meeting of the Council since the last meeting of the Association, and that not a sufficient number of the members were present to have a meeting at the present time. He therefore moved that the by-laws be suspended, and that the papers of candidates for admission be referred to such members of the Council as might be present, with two other members to be appointed by the President. Carried.

The President appointed Drs. Putnam and Mills to act with Dr. Hammond as councillors.

After a recess the Council reported that they had examined the papers presented by the following candidates, whom they recommended should be elected to membership in the

Association : Drs. Leonard Weber, of New York ; G. L. Walton, of Boston ; and J. T. Eskridge, of Philadelphia.

The President appointed G. M. Hammond, teller, and a ballot was taken on the name of Leonard Weber, and the result showed that he was unanimously elected. Dr. W. J. Morton was appointed teller to take the ballot on the name of G. L. Walton, and the result showed that he was unanimously elected. Dr. Kinnicutt was appointed teller to take the ballot on the name of Dr. J. T. Eskridge, and the result showed that he was unanimously elected.

On motion by Dr. SHAW Dr. R. W. Amidon was nominated Secretary *pro tem.*, and was unanimously elected,

The Secretary *pro tem.* then stated that he had received several pamphlets, monographs, and letters from various members of the Association, and from others, and on motion they were accepted and ordered placed on file.

Dr. AMIDON also read the report of the Treasurer, which upon motion was adopted.

NOMINATION OF CANDIDATES.

Dr. W. A. HAMMOND nominated Dr. Ralph L. Parsons, of Sing Sing, New York.

The President nominated Dr. Charles F. Folsom, of Boston.

NOMINATION OF OFFICERS.

Dr. W. J. MORTON nominated Dr. Isaac Ott, of Easton, Pennsylvania, for President.

Dr. W. A. HAMMOND nominated Dr. Landon C. Gray, of Brooklyn.

Dr. CHARLES L. DANA nominated Dr. C. K. Mills, of Philadelphia, but Dr. Mills declined the nomination.

Dr. MORTON moved that the nominations for President be closed. Carried.

Dr. V. P. GIBNEY nominated Dr. W. R. Birdsall, of New York, for Vice-President.

Dr. F. P. KINNICUTT nominated Dr. J. J. Putnam, of Boston.

On motion the nominations for Vice-President were closed.

Dr. J. J. PUTNAM nominated Dr. R. W. Amidon for Secretary and Treasurer, but at the suggestion of Dr. W. A. Hammond, withdrew Dr. Amidon's name, and substituted that of Dr. E. C. Seguin.

Dr. V. P. GIBNEY nominated Dr. R. W. Amidon.

On motion the nominations for Secretary and Treasurer were closed.

Drs. J. J. Putnam, of Boston; V. P. Gibney, F. P. Kinnicutt, and W. J. Morton, of New York, were nominated for Councillors.

The President appointed Drs. S. G. Webber, of Boston, and C. K. Mills, of Philadelphia, Tellers, and as a result of balloting the following officers were elected :

President, Dr. Isaac Ott, of Easton, Pennsylvania.

Vice-President, Dr. W. R. Birdsall, of New York.

Secretary and Treasurer, Dr. R. W. Amidon, of New York.

Councillors, Drs. V. P. Gibney and W. J. Morton, of New York.

MISCELLANEOUS BUSINESS.

The Secretary read a communication from Dr. W. Bechterew, of St. Petersburg, with reference to the annual prize offered by the Association, called the Hammond prize.

On motion of Dr. WEBBER, of Boston, the Secretary was authorized on behalf of the Association to acknowledge the receipt of the communication.

Dr. CHARLES L. DANA, of New York, moved that the President appoint a Committee of two to prepare suitable resolutions with regard to the death of Dr. George M. Beard.

The President appointed as such committee Dr. C. L. Dana and Dr. C. K. Mills, and also suggested that instead of resolutions such as are usually reported under such circumstances, the Committee prepare a letter or a minute, which could be entered upon the record without the form of adoption by the Society; the mere fact of a Committee being appointed, in accordance with a motion passed by the Society, being evidence that the Association had taken action concerning a deceased member.

There being no other miscellaneous business the Association proceeded with its scientific work.

Dr. W. J. MORTON, of New York, then read a paper on "Neuritis following dislocation."

The paper constituted a contribution to traumatic neuritis, and was illustrated by a case following dislocation of the humerus. The essential features were the following: injury to the brachial plexus, motor paralysis, sensory disturbance (exaggeration of tactile sense, hyperalgesia, diminished temperature sense), reaction of degeneration, œdema, glossy skin, painful joints, causalgia, fibrous hyperplasia, neuro-muscular hyperexcitability, extension of disturbance to opposite member. That is to say, ascending neuritis.

The patient, Alexander M., sixty-five years of age, about ten months ago slipped on the sidewalk and fell, striking on his right shoulder. His arm was rendered nearly motionless, the shoulder painful, and soon the hand and forearm swelled. He went to Bellevue Hospital, had his shoulder "set," and remained there two days. From the hospital records the following note was taken: "Admitted September 27, 1882. Diagnosis: alcoholism and dislocation of the humerus. Discharged September 29th." The record was important only as establishing the fact that dislocation existed. About a week after the accident occurred pain began in the hand, and has continued up to date, although diminished in degree. At the same time the hand began to swell, and later the skin became glazed. At the present time the hand is much enlarged, stiff, brawny, and club-like, presenting a marked contrast with the wasted arm. There was some œdema, and the nails were curved and club-shaped, and presented transverse ridges, and grew very rapidly. There is complete atrophy of the hairs.

Dr. Morton then gave in detail the motor and sensory symptoms, and the electrical reactions, with reference to neuro-muscular hyperexcitability. The biceps could be made to produce strong contraction by pinching any portion of it with the finger, or making pressure with a penholder; and once in contraction it remained so for about a minute, no matter at what angle it was placed. Thus a tendency to

the cataleptic condition was superadded to excitability to mechanical irritation. There also existed marked fibrous hyperplasia, affecting the pulp of the fingers, and occupying the interspaces between the phalangeal joints.

The electrical reactions in the left arm showed that this too is now affected to a certain extent. There is diminution of the cathodic closure to contraction in certain groups of muscles. The patient had been treated with electricity, severe blistering over the track of the brachial plexus, hot and cold douches, and cod-liver oil, and in view of the nature of his injuries had made excellent progress.

An interesting feature in the case was the fact that the left or opposite arm at the end of ten months showed evidence of being affected by the injury originally inflicted upon the right axillary plexus. Quantitative electrical changes were present, and approach to the reaction of degeneration so prominently displayed in the right arm; but more curiously, neuro-muscular hyperexcitability was also present in the left arm, although in a modified form. Mitchell records a number of cases in which from an injury of the nerve of one member the corresponding member becomes affected. Recently Charcot, in a clinical lecture, referred to an instance of contusion of the sciatic nerve, where the neurosis extended upward and involved the cord, and caused motor and sensory disturbances in the opposite leg.

Two noteworthy symptoms remained to be noticed: First, fibrous hyperplasia; second, the phenomenon of neuro-muscular hyperexcitability. The usual nutritive disturbance following neuritis is atrophy of various tissues. Dr. Morton had found only one case of hypertrophy of the connective tissue—that reported by Weir Mitchell,—and in his case the condition of the limb could almost be described in the same language which had been used by Mitchell, and the case formed a fitting companion for it. Charcot, in his thorough study of the disorders of nutrition consequent upon lesions of the nerves, makes no reference to hypertrophy of the connective tissue. This case, then, as regards the hyperplasia, ranks with Mitchell's as a unique observation.

With reference to neuro-muscular hyperexcitability, if

we would find an exact parallel we must turn to Charcot's description of the condition discovered by him during the lethargic stage of hypnotism, and designated by him neuro-muscular hyperexcitability. After reviewing Charcot's views and conclusions at some length concerning this phenomenon, Dr. Morton concluded that neuro-muscular hyperexcitability is not alone found in the hypnotism of the hysterical, but that it may exist in ascending neuritis which has reached the spinal centres.

Remarks on Dr. Morton's Paper.

Dr. C. K. MILLS, of Philadelphia, said that Dr. Morton's case called to mind several cases of brachial neuritis which had fallen under his observation, two or three of which he had already reported at different times. In one of them he remembered distinctly most of the phenomena mentioned by Dr. Morton, even that which he had spoken of under the term of neuro-muscular hyperexcitability; this symptom was present in one arm at least.

In one case the patient got his arm caught in a belt of machinery. The arm was broken, and there was immense torsion exercised upon it. That case was first seen by him five or six years ago, and finally became one of the chronic cases at the Philadelphia Hospital. The patient had somewhat recently developed a similar condition to that described by Dr. Morton as existing in the other arm.

As to the question of neuro-muscular hyperexcitability, there could be but little doubt that it presented one of the best fields for discussion from a scientific standpoint.

In the case of the man who had his arm caught in the belt, this condition of excitable response in the muscles was present, and whether it was of the same nature present in the cataleptoid forms of hypnotism, such as is seen in the cases reported by Charcot,—also seen by many others,—would be an interesting question for study. The best explanation at present seemed to be, as Dr. Morton had stated, that the phenomenon depended upon undue reflex action. Then the question arises, what gives the muscles, or group of muscles, the power of repose and relaxation in the ordinary

normal condition; and speaking in general terms, this might be answered by stating that it is due to the balance between the cerebral control and spinal reflexes; perhaps better, the balance between the spinal control and automatic reflex. We have in the hypnotic condition alluded to the same sort of condition, but the cause of it is at the other end of the nervous system, and the cerebral inhibitory action in the ganglion cells is dormant, or in a suspended condition. There may exist a condition of this kind of simple hyperexcitability of the nerves and an inflammatory condition of the spinal centres themselves, the cerebrum remaining comparatively intact. We see this exalted reaction and similar phenomena in cases in which there is limited inflammation of the cord, as in compression myelitis, which are practically, so far as explanation goes, nearly the same. Only day before yesterday he saw a case of this kind in which there was not only pain, but hyperexcitability at various motor points for the muscles of the legs, which were practically the same as shown in the case with neuro-muscular hyperexcitability of Charcot. In such cases there is simply a neuritis, and the hyperexcitement of the spinal centres explains the exalted reflex action which results. He did not wish to say that he could absolutely limit the production of movement of certain muscles which work in harmony, but the excitability seemed to depend upon the neuritis which secondarily gave rise to an excitable condition of the spinal cord.

Dr. GIBNEY asked Dr. Mills if, in the cases of compression myelitis, he wished to be understood that the excitability of the spinal nervous centres inhibited the cerebral activity.

Dr. MILLS replied that the cases were susceptible of a double explanation; that the exalted reflex action might follow local irritation, giving rise to an excited condition of the reflex centres of the cord. On the other hand, where you have the cerebral inhibitory apparatus cut off, from the very nature of the case you have put the impressions made upon the peripheral portion beyond the control of cerebral power.

Dr. GIBNEY thought the question an important one, as

bearing on prognosis to be given in Pott's disease, because where the excitability of the muscles was most marked in those cases, he could promise the patient that there would be a more complete cure, and within a shorter time, than when the excitability of the muscles was delayed for some time. He doubted with the two theories advanced by Dr. Mills, whether such a prognosis could be so safely given.

Dr. WEBBER, of Boston, said that he did not know that he could add any thing to the scientific portion of the discussion, but he had been interested with reference to treatment. He thought that sometimes we lost sight of treatment in considering the essence of the question. The treatment of neuritis is rather unsatisfactory at best, although he had found, in his experience, that that which had been recommended by Dr. Morton had afforded the most relief; namely, the application of blisters. He had treated patients with electricity without blisters, and had been dissatisfied, and he had been obliged to resort to blisters or to some form of counter-irritation, and in every case which he had had under his care the patients had done remarkably well. He had had several cases where inflammation extended up the nerves, and in one case it had apparently nearly reached the spinal cord. There was none of the hyperplasia mentioned by Dr. Morton, and with reference to excitability, he did not test it on account of the pain and the general condition of the patient, but in this case blisters did more good than any thing else that was employed. The after-treatment by electricity is of much value, but according to his experience electricity alone had not proved satisfactory.

Dr. W. A. HAMMOND thought that one of the prime elements in our methods of effecting a cure in neuritis, is to secure as far as possible rest of the nerve. We know very well that in conditions affecting other tissues, rest is one of the most essential elements in cure. We know that in inflammation of the retina very much light is prejudicial to the progress of the case, and it had seemed to him that the mere transmission of mental action to the voluntary muscles tends to aggravate the inflammation and to retard cure, and

for that reason he had invariably enjoined absolute rest, and in several cases he had resorted to stretching of the nerve for that very purpose. It had seemed to him that the only way in which stretching of an inflamed compound nerve can act is by securing rest. Not long since an officer of the navy was referred to him, suffering from neuritis, and he recommended stretching of the nerve in his case. The circumstances were such that he was unable to submit to the operation here, nor was he able to submit to the treatment at the hands of Dr. Bloodgood, from whom Dr. Hammond received the patient, but he gave him a letter to Dr. Wales, Surgeon-General of the Navy in Washington, who performed the operation of stretching the nerve, and the result was complete relief of the intense agony from which he suffered, and it eventually cured the case. Dr. Hammond thoroughly agreed with Dr. Webber in his endorsement of the use of blisters, but he did not think that blisters could take the place of rest. With regard to the use of electricity, he thought that every thing which jarred the nerve did harm, and he did not know of any thing more prejudicial to rest of the nerve than the use of the faradic current. The passage of the continuous current, if arranged properly, possibly might do some good, the same as the application of nitrate of silver is beneficial to an inflamed eye, but he was not sure that it was very beneficial. He was very positive that faradism, at least in his hands, had been a very great means of aggravating the pain and retarding cure, but so far as counter-irritation is concerned, he did not know of any thing better than blisters, unless it was the actual cautery, which he had used in some cases with good results. In one case particularly, of a protracted inflammation, he had derived very excellent results by the application of the cautery, and he thought that the application of the hot iron along the course of the nerve was very frequently beneficial, especially as far as relief from pain was concerned.

Dr. WEBBER remarked that he thoroughly agreed with Dr. Hammond with regard to rest, and that that point was in his mind when he arose to speak, but he accidentally omitted to mention it. Sometimes he had applied the

starch bandage, which gave still greater rest than could be obtained without giving some artificial support. He would not think of using the faradic current on account of the irritation which it gives the nerves. He had used the galvanic current as carefully as possible, producing as little variation in the current as might be, using both the ascending and the descending currents, without any benefit at all in cases which finally rapidly improved under rest and blisters. The case last mentioned by Dr. Hammond was somewhat different from traumatic cases, but cases arising from brushing of the nerves in dislocation and stretching, etc., he had found to be benefited by this method of treatment. With reference to the actual cautery, he had had comparatively little experience in its use in these cases, but in other cases of neuritis he had used it with advantage.

Dr. PUTNAM, of Boston, thought the discussion should not be allowed to pass without a few words in favor of the use of ice, which he believed to be a remedy of the greatest possible value; of course it should be combined with rest. He thought it was of greater value than any other one remedy which he had resorted to. The objection sometimes raised that it increases the irritation of the inflamed part is applied to cold when used of too low degree and intermittently. If ice is used day and night in succession, or a great many hours together, and the precaution is taken not to have the cold too great, having sufficient flannel between it and the skin, it is of the greatest possible value. He remembered Dr. Mitchell speaking to him of the application of ice in the treatment of sciatica, applied along the thigh and leg, and he had used it in one or two cases for several weeks together with marked relief and permanent beneficial results.

Dr. C. L. DANA, of New York, read a paper entitled, "Note on hydrobromic acid as a substitute for the bromides." After making brief reference to the literature of the subject, Dr. Dana stated that this acid had been used by the profession chiefly with quinine, under the belief that it prevents or lessens cinchonism. The only extended record of clinical observations regarding it that he had been

able to find was one by Massini, published two years ago, who used it in thirty-one cases of various kinds without special benefit. Dr. Dana was led to experiment with hydrobromic acid in the hopes that it would have produced the beneficial effects of the alkaline bromides in epilepsy, without causing depression and scurvy. He had now used hydrobromic acid in the treatment of various nervous affections for nearly two years at the Northeastern Dispensary, and of over fifty cases had clinical notes. They included epilepsy, alcoholism, congestive headache, unilateral headache, spermatorrhœa, vertigo, general nervousness, chorea, insomnia, hysteria, paralysis agitans, post-hemiplegic cerebral (vascular) disturbance, senile melancholia. The officinal dilute acid is a ten-per-cent. solution, of which the dose would be from one drachm to two drachms and a half, well diluted. In epilepsy, some patients received marked benefit from the use of the acid in doses of four to five drachms a day. Dr. Dana believed, however, that in epilepsy hydrobromic acid could not be used as a substitute for the bromides except in the non-controllable cases, and yet it undoubtedly has a controlling influence over the disease. In chorea, he thought the acid could be used advantageously as a medium for arsenic or strychnine when it is desired to give a sedative. In alcoholism it failed in two cases, the patients being on the verge of delirium, and the bromides with chloral were subsequently given with relief.

Hydrobromic acid is a good solvent of quinine, but it does not prevent cinchonism as has been asserted, certainly not in the small doses usually prescribed. In most cases of insomnia it also acts well. He was positive that he could give the acid with just as much confidence that it would produce nervous sedation as when the alkaline bromides are prescribed. Its advantages are, that in moderate doses it is not disagreeable; it does not constipate or irritate the stomach; it may be given when an acid is indicated for the stomach; it can be conveniently prescribed with iron and tonics, and finally, in the largest doses, long continued, he had never seen any sign of bromism or any disagreeable constitutional effect other than some drowsiness. He be-

lieved that the ordinary custom of prescribing from twenty minims to one drachm of the three-per-cent. solution, the strength ordinarily employed, or even of a ten-per-cent. solution, was generally much too small a quantity. Theoretically, in order to get the sedative action, from a drachm and a half to two drachms and a half of the ten-per-cent. solution must be prescribed. Practically, he had found that very satisfactory sedative effects could be produced with drachm doses of the officinal dilute solution.

In conclusion, the acid could be substituted for the bromides in all the milder affections for which the latter are used. It had appeared to him to be especially efficient in producing vascular and nervous sedation in the post- and prae-hemiplegic conditions. Unless given in very large doses it takes several days to get its best sedative effects.

Remarks on Dr. Dana's Paper.

Dr. W. A. HAMMOND, of New York, said he began the use of hydrobromic acid some seven or eight years ago in accordance with Fothergill's formula, which gave a solution of a strength of three per cent. He had also used it in a much stronger solution. Of the three-per-cent solution, he had administered a teaspoonful or more at a dose, and continued to employ the remedy up to a comparatively recent period, but had abandoned it because he was unable to see that it did any good except in a very limited number of cases. He had found, however, that it does prevent the unpleasant effects of the sulphate of quinine, and he formerly administered it in combination with that drug, but even there it had not, in his experience, been so efficacious as corresponding doses of one of the alkaline salts of bromine. He did not think, in this particular, that it had any advantages over any one of the alkaline haloid salts, or that it could be used as a substitute for them. For the prevention of cinchonism, however, a small dose of the bromide of sodium administered with quinine was far more efficient. Hydrobromic acid did prevent the unpleasant effects of the sulphate of quinine, and it had been his custom to prescribe in combination five to ten grains

of quinine with one drachm of hydrobromic acid, and uniformly cinchonism had not been produced, but further than that he had not derived any satisfaction from the use of the drug. He had, however, used it in comparatively small doses, except in one case in which he prescribed as for Fothergill's solution, but he omitted to make that statement, and the patient took the prescription to the apothecary, who gave him Squibb's solution, which is a ten-per-cent. solution, and took it according to directions, and it nearly killed him. He took it in a small quantity of water, and it produced excessive irritation, and he even went so far as to consult a lawyer with reference to bringing a suit against the apothecary, but Dr. Hammond advised him not to bring the suit, and in that way the apothecary escaped, as did also Dr. Hammond. The bad results, however, were due simply to the local irritation produced by the stronger preparation not properly diluted.

Dr. ESKRIDGE, of Philadelphia, said that he began the use of hydrobromic acid in 1876, and adopted it for its effects upon the ear. He thought that it indeed did have an influence on buzzing in the ear, but only in certain cases; only in those cases which have this unpleasant phenomena from congestion of the internal ear, and he believed that this was one of the ways in which it lessened the bad effects of quinine; that is, by diminishing the congestion. He could corroborate Dr. Hammond's statement with regard to the influence of hydrobromic acid in lessening the unpleasant effects of quinine.

There was another class of cases in which he believed it could be used with benefit. He thought that in typhoid fever there was an indication for the administration of an acid, and he believed that hydrobromic acid was the best preparation that could be employed. He had, however, almost entirely abandoned its use for the purpose of counteracting the unpleasant effects of quinine, and had substituted either the bromide of sodium, or, better still, morphine.

Dr. DANA, in closing the discussion, said that Dr. Hammond had prescribed the doses which were usually given of

Fothergill's solution, which, as his druggist had told him, was a three-per-cent. solution. As he recollected, the dose given in the United States pharmacopœia was two drachms of the ten-per-cent. solution. Those who had been prescribing from one to two drachms of the three-per-cent. solution had been giving only three or four grains of the bromide of potassium, and, therefore, he thought they had not tested the acid so far as its sedative effects were concerned. With reference to the palatableness of the acid, if one drachm of the ten-per-cent. solution were combined with a drachm of cinnamon water and from one to three drops of nux vomica, it made a palatable dose. A five-per-cent. solution was one which the patient could easily take. He had always been in the habit of telling the patient to dilute the dose well, certainly in one-quarter or one-half a tumbler of water, and he had had no complaints from its causing nausea or gastric disturbance.

So far as the influence of hydrobromic acid in preventing cinchonism was concerned, of course Dr. Hammond's experience and his own were at variance. He had had extensive opportunity to test the drug clinically, however, and he had not been able to see that cinchonism had been prevented in that particular case, and he had not seen any clinical reports which he had thought would prove that cinchonism could be prevented by the use of this drug. Still he was willing to accept the larger experience of those gentlemen who did not agree with the results of his observations.

Dr. HAMMOND said that there was one point upon which he would like to ask Dr. Dana a question for the sake of information. He had been accustomed for several years to give a tonic solution containing strychnine, sulphate of quinine, pyrophosphate of iron, dilute phosphoric acid, and syrup of ginger. Several years ago he substituted hydrobromic acid for the phosphoric acid for the purpose of preventing the unpleasant effects produced by the sulphate of quinine, and he had received from several different sources positive information that the strychnine had been precipitated so that nearly the entire quantity contained in the

prescription had been taken at the last dose. It seemed to him that if that was so it was a matter of considerable importance with reference to the combination of strychnia and hydrobromic acid. Strychnia is soluble in phosphoric acid, but it seems to be precipitated in the presence of bromine. He thought that the same thing occurred when any one of the soluble bromides is given in conjunction with strychnia.

Dr. DANA replied that he imagined the precipitation is due to the fact that dilute hydrobromic acid is prescribed. He was quite sure that a ten-per-cent. solution of hydrobromic acid will dissolve strychnia; at least his druggist had told him so, and he had used it accordingly. At the same time he did not wish to state with positiveness without further inquiry, because he had not made experiments himself with reference to this particular point. He had administered it with arsenic, and felt quite sure that dilute hydrobromic acid will dissolve arsenious acid; for when the dilute acid is mixed with Fowler's solution it makes a clear solution, and he had been accustomed to prescribe it in that way.

Dr. J. J. PUTNAM, of Boston, then read a paper on "Lead-poisoning simulating other diseases; a source of error in the analysis of the urine for lead." A number of cases had come to his notice within the past few years, in which an examination of the urine has shown the presence of lead, which the symptoms and clinical history were not such as are usually considered characteristic of lead-poisoning; in fact simulated other types of diseases. One case resembled the so-called lateral sclerosis, one of the transient forms of poliomyelitis anterior; two others, a more diffused form of myelitis: while both were cerebral neuroses.

It is of course nothing new to say that lead-poisoning may simulate other diseases, or that any one or all of the classical symptoms may be wanting. So far as he knew, the first case in which lead was supposed to have given rise to symptoms simulating any other form of spinal diseases than poliomyelitis anterior, is one reported by Dr. F. Minot, of Boston, before the Medical Improvement Society, in 1881,

and recorded in the *Boston Medical and Surgical Journal* for the same year. Here the symptoms of so-called lateral sclerosis were present to some degree; lead was twice found in the urine, and the patient improved materially under the use of iodide of potassium. Dr. Webber, at the last annual meeting of the Association, directed attention to a certain point in the pathology of lead-poisoning, and again brought forward this fact of the relation between it and organic disease of the spinal cord. Although the idea is not new, Dr. Putnam ventured to think that we had not, as yet, realized how often this will occur. In none of the eight cases reported in his paper, were blue line on the gums, colic, emaciation, or discoloration of the skin, characteristic localized trophic paralyses, or typical cerebral symptoms present, and the diagnosis was established solely through the examination of the urine after the administration, for a few days, of the iodide of potassium. It is, of course, not certain that the symptoms reported were really due to the influence of the lead; and even if this could be shown, it would still be uncertain whether the lead acted in virtue of the special affinity for certain tissues, or indirectly by interfering with the nutrition of the cord, or the general nutrition, to such a degree as to allow latent susceptibility, or otherwise insufficient causes of disease, to become active causes,—play a similar rôle to that probably played by syphilis in the causation of tabes dorsalis. All the chemical work of the investigation was done in the laboratory of the Harvard Medical School under the supervision of Professor E. S. Wood. Under the vague term lead encephalopathia, a variety of nerve symptoms have been described, of which delirium, mania, dementia, epilepsy, and coma, are at once the severest and the better recognized; but the disease is no doubt capable of giving rise to a variety of less slowly marked but not less important signs. The pathogenesis of these conditions is obscure and certainly complex, but the relation of lead-poisoning to nephritis, gout, anæmia, points out more than one direction in which a rational explanation is to be sought.

Apropos of the contamination of water from lead pipes, Dr. Putnam mentioned a point of practical interest obtained

from an intelligent plumber. It is well known that hot water is more apt to dissolve lead than is cold, but it is not, probably, so generally realized that this fact makes it objectionable to run hot- and cold-water pipes side by side through houses, especially when the latter carry water for drinking purposes. The plumber assured him that cold-water pipes under such circumstances are apt to be considerably corroded.

Dr. Putnam then directed attention to a caution necessary in the chemical examination of the urine for lead, and to the occasional, if not frequent, source of error. The detection of this metal is by no means without its difficulties. The quantity of lead present in the urine, especially when no iodide of potassium is being taken, and also after this drug has been taken uninterruptedly for some time is very small. The quantity of urine, therefore, analyzed should be at least one quart, and should be collected during the administration of iodide of potassium, given either for the first time or after an interval of repose. One source of error has recently suggested itself to Prof. Wood, and it is that the tests hitherto used for lead apply equally well to bismuth, a drug that is very frequently prescribed both in private and hospital practice. How long the bismuth continued to pass off through the urine has not been shown, but it has been found in the tissues of the rabbit for eight days after the administration of a few grains, and also in the human liver and kidneys five days after the administration of fifteen grains.

For the sake of investigating this point further Dr. Putnam took from thirty to forty-five grains of subnitrate of bismuth daily for two weeks. At the end of this time, while still taking the drug, his urine contained bismuth. After ceasing to take the drug for twenty-four hours he again took iodide of potassium, and his urine again contained bismuth. The most reliable way to avoid the error is to make sure that the patient has taken no bismuth within a considerable period before the examination for lead is made. Dr. Putnam was obliged to omit two cases from his collection on account of this discovery.

At the close of the reading of his paper Dr. Putnam exhibited a metallic urinal designed for females, to be used while sitting in a chair.

On motion by Dr. W. A. HAMMOND the discussion on Dr. Putnam's paper was postponed until the evening session.

The Association then adjourned to meet at 8:30 P.M.

First day, evening session.

The Association was called to order at 8:30, P.M., by the President.

Present—Drs. Edes, Eskridge, Weber, Webber, Morton, Walton, Shaw, Putnam, Ott, G. M. Hammond, Amidon, Dana, Sinkler.

Remarks on Dr. Putnam's Paper.

Dr. WEBBER, of Boston, said that the paper was an interesting one, and he believed that we had not yet got at the bottom of the influences which lead may have upon the nervous system. Dr. Putnam had spoken concerning various sensory disturbances, particularly anæsthesia, which some of his patients suffered from. Dr. Webber had noticed in every case of lead-poisoning affecting the spinal cord, which he had examined, that the patients had various disturbances of sensation. These were sometimes so insignificant that patients paid but little attention to them, and it was necessary to cross-examine and return to the subject time after time, in order to find out whether or not these disturbances of sensation existed. At other times the disturbances were so marked that the patients spoke of it themselves. Dr. Putnam had also mentioned one source of error in examining the urine for lead, and Dr. Webber wished to speak of another, namely, that if the urine is allowed to stand and undergo partial decomposition, it becomes alkaline, and a chemical reaction takes place between alkaline urine and the glass itself, by which lead is set free and appears in the urine. He had therefore been in the

habit of asking patients to put a small quantity of acetic acid into the bottles in which the urine was preserved, in order that this source of error might be excluded.

Dr. MILLS, of Philadelphia, said that Dr. Putnam's paper had interested him in a direction of which he thought it worth while to speak; that it is a proper view concerning the nature of this and other metallic toxic poisons. He thought that not a sufficiently comprehensive view of cases of this kind was usually taken. Every one in practice had seen cases of toxic effects upon the nervous system produced by arsenic, copper, and other metallic agents, and also such as were manifested by diphtheritic paralysis, paralysis following various so-called zymotic diseases, and we were apt to take a too limited view with reference to these agents. Just as Dr. Putnam's cases had pointed out, while we are likely to have typical forms of the affection, we may get affections of all kinds, cerebral, spinal, and otherwise, and he had seen not only bilateral paralysis of the extensors, but almost every form of paralytic affection, and also some forms of tremor in lead-poisoning. In a paper which he had read on arsenical paralysis he referred to a number of cases found in literature, and quoted the view expressed by Ringer in his work on therapeutics, which is a very suggestive one. Ringer suggests that these poisons affect protoplasm, and Dr. Mills thought there was a great deal in that single sentence of suggestion, and he thought that if cases of lead paralysis were studied in their extreme minutiae it would be found that not only the nervous system was affected, but that other organs were involved, either in the way of diminution of their physiological function or their elective action, and that the nervous phenomena were perhaps largely in proportion to the effect produced of this character. Certainly it is so in arsenical and phosphorus poisoning, and perhaps in diphtheritic poisoning, where myelitis may occur as a result of the action of the toxic agent, or neuritis attended with myelitis, and the tissues everywhere affected; that is, the poison is a protoplasmic one, and has a particular selection, for reasons which we do not at present know, for certain parts and certain systems.

Dr. PUTNAM, in closing the discussion, said that his paper was prepared with special reference to two practical points. He thought it important to make routine examination of the urine in a great many cases, to see how far we can find lead where no characteristic symptoms are present. The second point was with regard to bismuth; that is, that the same reaction is obtained with bismuth as with lead, and therefore it is important that bismuth should not have been taken for a considerable time prior to the testing of the urine for lead. It has not yet been positively determined how long bismuth remains in the body before it is entirely eliminated, but evidently it is not entirely eliminated for some time.

At a subsequent session of the association, Dr. Putnam added the following fact: that according to the last examination made by Prof. Wood, bismuth had been detected in the urine as late as four weeks after it had been taken.

Dr. J. T. Eskridge, of Philadelphia, read a paper which included the report of "A case of general neuralgia."

G. B., a German, twenty-nine years of age, married, a laborer in a foundry. Denied ever having had venereal, and there was no external evidence of specific disease, and his children—three in number—were well developed and healthy. He enjoyed good health until the year 1873, when he suffered from an attack of pneumonia, affecting the left side, and was confined to his bed four weeks. Two years ago, after sleeping one night in a damp bed, he noticed a dull heavy pain in the dorsal and lumbar regions of the spine. This pain continued about one month, and was then accompanied by severe pain in the course of the left sciatic nerve. During these two months he managed to hobble to and from his work, a distance of several squares, and was compelled to stand on his feet about two hours daily. The following summer he was able to walk quite well, although a little pain was experienced when the left sciatic nerve was firmly pressed upon. In October, 1881, melted iron fell into his left shoe and burned his ankle severely. The burn was mostly superficial, but its area was greatest around the internal malleolus; on the outer aspect of the ankle the area was small, but the wound extended to the bone. For this burn he remained in the hospital of the University of Pennsyl-

vania ten weeks, and left comparatively free from pain, and returned to his work. One week later he began to experience great pain in the left leg and ankle. This attack lasted about one month, and the pain was greatly relieved by pressure over the sciatic nerve as it emerged from the pelvis. During the next ten weeks he suffered more or less pain, but was able to work. In October, 1882, he remained five weeks in the hospital, suffering from severe pain which extended from the lumbar region down the posterior portion of the thigh and leg to the left foot, most intense in the ankle. He improved somewhat in the hospital, but after returning to his work the pain became worse than it had been at any previous time. In January, 1883, he was scarcely able to walk, complained of great pain in the leg and back, sleep was broken, appetite capricious, bowels constipated, temperature 100° , pulse 92, respiration 24. His spine was tender on pressure in the dorsal and lumbar regions. All the superficial nerves of the left leg and gluteal region were the seat of neuralgic pain, and the light pressure over any portion of the affected nerve greatly increased his suffering. Nothing except hypodermic injections of morphia and atropia afforded any relief, and the effect of these medicines soon diminished. Chloroform injections increased rather than diminished his pain. In February the internal saphenous and genito-crural nerves became neuralgic. The left side of the scrotum was red and burned like fire, and was exceedingly sensitive to the touch; the right side was normal. Double intercostal neuralgia soon became well established and nearly constant. The only relief afforded the patient came from the alternate use of hot and cold applications to the spine and painful sciatic nerve; bladders filled with ice and rubber bags with hot water were alternately applied every five minutes for an hour each day. When this was faithfully carried out the pains were greatly lessened, no morphine was required, and the patient's appetite and general condition improved. Finally this plan of treatment was abandoned because of lack of assistants in the hospital; but by the middle of April the man could walk slowly about the wards. Most of the large superficial sensitive nerves were painful to pressure; the left fifth cranial nerve alone having escaped.

On the 12th of April he first experienced slight pain in the right sciatic nerve, and it became painful soon after the moderate application of the faradic current. On a few occasions since there has been slight pain in the right knee, but the right sciatic nerve now

does not seem to be generally involved. Electro-muscular contractility was well preserved and about equally on both sides of the body, but was increased in the left leg and in both arms. The special senses were not affected, except that smell was not so acute, and taste on the left side of the tongue was impaired.

May 29th. No waste of muscles. His general condition has been improved for two months, during which time he has been treated exclusively by faradism.

June 4th. Reflexes normal. Dr. Eskridge exhibited tables of cutaneous sensibility and surface temperature of various parts of the body. The axillary temperature varied from 98.6° to 99.1° .

The question of diagnosis was one surrounded with some difficulties. Has not the case been one of general neuritis following inflammatory spinal trouble and improvement?

In favor of general neuralgia were the following reasons :

First. It is a disease which has extended over a period of more than two years, made up of pain lasting from two to six months in a man whose condition and general appearance to-day seemed to be as good as they were after the first attack in the year 1881.

Second. That several times, by firm pressure over the great sciatic nerve as it emerges from the pelvis, he had succeeded in relieving pain in the foot and leg.

Third. That in inflammatory condition of the cord of so long duration, reaction of degeneration and other trophic disorders would probably be found, and improvement would be slower if it occurred at all.

Fourth. That the left leg and right fifth cranial nerve were severely affected, while the left side of the face entirely, and the right leg almost entirely, escaped.

Fifth. That pain was often shooting or steady in character, differing from the dull pain of neuritis.

Syphilis was eliminated not only by the history of the case, but by treatment.

Remarks on Dr. Eskridge's Paper.

Dr. WEBBER, of Boston, said that in the report of the interesting case by Dr. Eskridge the fact that electrical reaction of muscles was not disturbed would militate

against its being a case of general neuritis or polio-myelitis. If neuritis, it must have been an inflammation of a sensory nerve. The case as it is reported is obscure, and he would not undertake to add any thing to what had been said in regard to its essential nature.

The President asked if the temperature at any time was above the normal.

Dr. ESKRIDGE replied that we did not really know what the normal temperature of the legs is. The temperature differed very much at different times, as much as a degree and a half between the healthy and the affected leg. The temperatures as recorded on the charts presented were taken from various parts of the body, and also in the rectum and axilla, and in the latter region it was raised from a half to one degree and a half.

Dr. LEONARD WEBER, of New York, regarded this case as one of spinal lepto-meningitis, and within the last two months he had observed two similar cases, although not so severe as the one reported, but in their general features very much like Dr. Eskridge's case.

The first concerned a man fifty-five years of age, who during the last five or six years has been more or less neurasthenic, and who, after the exertion of a comparatively long walk for him, developed nearly all the symptoms described, in the paper, to which the term general neuralgia had been applied: pains along the brachial plexus, the sciatic nerves; and on examining the spine there was considerable sensitiveness on the spinous processes of the dorsal vertebræ, and Dr. Weber was able to exclude, as in the case reported, with certainty, polio-myelitis and also myelitis. He had no reason to regard it other than a case of spinal lepto-meningitis. Erb and Voigt had published a large number of these cases, all of which were very much alike—subacute in character, with a tendency to become chronic; and Dr. Weber regarded his case as one belonging to that class, treated it as such, and had the satisfaction of seeing the patient completely cured within two weeks. The treatment consisted in the use of dry cups along the spine, the internal administration of ergot and bromide of potassium.

The President asked Dr. Weber if there was any elevation of the temperature in either of the cases to which he referred, and also whether there were any post-mortems in the cases reported by Erb and others.

Dr. WEBER replied that in Voigt's cases no post-mortem examinations were reported, but some autopsies had been made, and he thought that in Professor Erb's cases the same results had been given.

With reference to his own cases, the temperature in the axilla was a half degree above the normal, and, besides, the attending physician said that there was fever at the outset of the case; exactly how much that meant he was unable to say, because no thermometric record was kept. Of the eighteen cases which had been reported, all were subacute at the outset with but little elevation of the temperature, and all ran a chronic course, recovery taking place only in the course of months, sometimes even years, and under the use of such means as dry cups, thermal baths, galvanism, together with such general treatment as each case might require.

Dr. ESKRIDGE, in closing the discussion, said that he was not prepared to accept the view which had been expressed by Dr. Weber until more post-mortems had been obtained, which would throw light upon those cases which apparently get well. He thought that if meningitis were present in his case the passage of the electrical current would give rise to pain, but it did not do so. Since the writing of his paper a few additional signs had developed: First, over the surface of the cutaneous nerves in the arms and body and on the right side of his face boils had appeared, some as large as a hickory nut and exceedingly painful; and, secondly, he is suffering at the present time from severe occygodynia. At the present time there is no pain at all over the back, and he was inclined to think that if leptomeningitis existed the patient would suffer from more or less pain.

Dr. CHARLES K. MILLS, of Philadelphia, read a paper on "Locomotor ataxia terminating as general paralysis of the insane."

Dr. Mills said that the relation between locomotor ataxia and general paralysis of the insane had been a problem of interest to neurologists and alienists since the investigations of Westphal in 1863.

He related the following case :

P—, æt. forty-seven, at the time of coming under observation, was a man of good constitution, noted for his strength and endurance, but for three years he had not been well, during most of which period he had been treated by different physicians for "rheumatism." He was addicted to venereal excesses, and used and occasionally abused alcohol. Many years before he had had a chancre, but had not subsequently had any of the evidences of secondary or tertiary syphilis. He had first suffered from darting or shooting pains in his feet and legs ; soon he experienced sensations of numbness and tingling in his feet, and later in the little and ring fingers of the left hand. For a short time he was troubled with double vision, and his sight had diminished a little in acuteness.

The results of an examination made during the first week he was under observation, were as follows : no paralysis was made out ; galvanic and faradic irritability were well preserved. He could not walk well after dark. He swayed and tottered on trying to stand with his heels together, or with his eyes shut ; and he could barely manage to stagger a few steps with his eyes closed. He complained of the numbness and tingling in his feet, which has already been referred to ; and the paroxysms of sharp, sudden pains in the limbs had become more frequent. He was awkward with his hands in dressing. Occasionally a disagreeable, vaporous sensation would begin in the fingers and creep up the arms and thence spread over the body.

A peculiar sense of constriction on drawing in the lower part of abdomen had annoyed him for several months. Sexual desire had diminished. Within four weeks he had lost seventeen pounds in weight.

He suffered from attacks of sleeplessness and from mental anxiety in regard to his physical condition ; but he had no symptoms of aberration of mind, he had no delusions, and was fully able to attend to his business, which required a large amount of physical and mental exertion.

Under the use of nitrate of silver, galvanization of the spine, and faradization of the extremities, he improved remarkably ; but

after remaining better for a few months, however, he again relapsed; and now in spite of all treatment, including medicines, electricity, rest, and discontinuance of business for a time, he got steadily worse. Occasionally, however, he would temporarily improve. The anæsthesia of his feet and hands deepened; the staggering gait returned and grew worse; every two or three weeks he would have frightful attacks of lancinating pains.

Decided mental symptoms first began to make their appearance two years after first coming under treatment. He spent his money very freely upon others as well as upon himself. His friends observed that his ideas were becoming queer and lofty; but the delirium of grandeur did not develop thoroughly, until nearly a year later, when he began to talk and act in the most preposterous manner. About the same time a peculiar stagger in his speech, a slight twisting of the mouth to one side, and some tremor of the tongue and lips, became noticeable when he talked.

On several occasions at this stage he had attacks of hæmoptysis, and he was troubled with a cough, and now and then with night-sweats. He lost weight steadily.

Nearly three years after the notes first made by Dr. Mills as to his spinal symptoms, and almost six years after the development of ataxic pains, he was sent to the insane department of the Pennsylvania Hospital, where Dr. Mills occasionally visited him.

His delusions became of the wildest character; he became irritable and hard to manage. Anæsthesia, tremor of tongue and lips, etc., increased. On two occasions he had slight apoplectic-form attacks, one accompanied by a slight spasm.

Later, he was removed to the State Hospital for the Insane, at Danville, Pennsylvania, where he remained until his death, which occurred five years and four months after first coming under the care of Dr. Mills, and about eight years after he was first affected with ataxic pains.

A post-mortem examination of the brain and spinal cord was made. The pia mater over both cerebral hemispheres, particularly in the postero-frontal and parieto-temporal regions, was opaque, congested, and adherent at points; decortication being marked. Convolutions were atrophied. The pia mater of the cerebellum, especially over the superior vermiciform process, was deeply congested and adherent. The pia mater of the spinal cord was thickened; and the cord presented an irregular shrunken appearance.

Microscopical examination showed marked sclerosis of the pos-

terior columns of the spinal cord throughout its whole extent, and that inflammation and thickening of the pia mater were also present everywhere. The sclerosis was most pronounced in the lumbar region, decreasing in intensity as the cord was ascended ; but was well marked throughout both in the columns of Goll and in the posterior root-zones. The medulla oblongata on one side was much sclerosed, and slightly so on the other side. Sclerosis was also present in the pons, crura, optic thalami, and convolutions examined, and in the cerebellum.

The pathological appearances shown by the microscope correspond closely to those mentioned by Westphal as occurring in the spinal cord in dementia paralytica. The first of the two groups presents clinically and anatomically the symptoms of tabes dorsalis, or gray degeneration of the posterior columns. On making a transverse section of the hardened cord, the posterior columns show few or no sections of nerve-fibres, and their place is taken by a connective-tissue substance. In the cervical region Goll's cuneiform columns are especially affected ; in the dorsal and lumbar regions, however, the entire area of the posterior columns is involved. In fresh preparations numerous fat-cells and corpora amylacea are found. This change can be followed upward only to the beginning of the fourth ventricle.

In this case the spinal symptoms were the first to appear. Three years before coming under the care of Dr. Mills he began to suffer with the lancinating pains of posterior sclerosis, although when first seen by him, and until he improved under treatment, he suffered at times from mental anxiety and sleeplessness, apparently the result of the pain and other distressing symptoms of the ataxia ; no typical mental symptoms appeared until more than two years after coming under Dr. Mills' care, and more than five years after the appearance of the first symptoms of spinal trouble.

Dr. Mills referred to the views of various authorities with reference to the relation of locomotor ataxia and general paralysis of the insane.

According to Westphal, with whom Hammond agrees, no direct relation exists between the morbid process in the cord in posterior spinal sclerosis and that in the brain in general paralysis of the insane. According to these authorities,

neither disease is secondary to the other, they simply co-exist as the expression of an excessive proclivity to diseases of the nervous system, just as any other two diseases may be present, one in the brain and the other in the cord, without their being any interdependence between them. Locomotor ataxia is by no means uncommon in patients affected with other forms of insanity (Hammond: "Treatise on Diseases of the Nervous System," sixth edition, p. 611). Hamilton (*New York Medical Record*, July 29, 1876,) discusses the relation of these two affections. Leidesdorf has related one case in which general paralysis was preceded by spinal symptoms.

Calmiel says that in many cases the changes proceed from the cord upward, and Baillarger endorses his views. Charcot has proved very conclusively that disseminated sclerosis can exhibit all the symptoms of general paralysis of the insane. Obersteiner considers that mental symptoms are found in the greater proportion of cases of locomotor ataxia. Cases reported by Obersteiner, Hamilton, Plaxton, Mickle, and others, were also referred to by Dr. Mills.

Remarks on Dr. Mills' Paper.

Dr. G. M. HAMMOND, of New York, asked Dr. Mills if there was any interruption of the reflexes in his case.

Dr. MILLS said there was a diminution of reflexes.

Dr. J. C. SHAW had seen one case of locomotor ataxia followed by general paresis of the type of dementia, and the patient died in an epileptic convulsion. The autopsy was made by Dr. Birdsall, who also made a microscopical examination of the brain and spinal cord, and, as Dr. Birdsall was present, he would doubtless give to the Association the results of his examination.

Dr. W. R. BIRDSALL, of New York, said there were one or two interesting points in the specimen referred to by Dr. Shaw. The cord showed throughout its length degeneration of the posterior columns, from the lowest part of the lumbar enlargement, easily traced upward to the nuclear termination. The degeneration presented the appearance of ordinary cases of sclerosis of the posterior columns, in

which the columns of Goll were more prominently involved, especially in the upper portions; the columns of Burdach and Goll in the lower portions. In addition to this, particularly in the posterior half of a transverse section, a peripheral sclerosis, which might be termed a cortical sclerosis, was distinctly present, which he believed to be secondary to slight meningitis, that which he imagined existed in the case reported by Dr. Eskridge. He would ask Dr. Mills if, at the site of meningitis, there was a sclerosis extending to a slight depth into the cord.

Dr. MILLS replied that there was, and also that he regarded it as important in connection with this and similar cases.

Dr. BIRDSALL further remarked that this change was not so prominent in the anterior columns as about the lateral columns, and that it gradually diminished as the anterior columns were reached. The changes found were similar to the ordinary changes of sclerosis, but in the medulla oblongata and pons, particularly the sensory tract of the medulla, instead of what would be termed true sclerosis, there was an increased vascularity, the smaller vessels about the central nuclei were very markedly increased, and its vascularity was more marked as it extended upward into the brain. He should also say that the usual lesions found in general paresis were found in the cortex and ganglionic bodies, and in this particular case which he had examined, amyloid degeneration of the vessels was especially prominent. Increase in the lymphoid elements was quite marked, and also shrinking of the cells of the cortex; and besides, there was marked increase in the capillary vascularity, together with thickening of the walls of the vessels. As he remembered the written history, it was a case which came under observation after symptoms of both locomotor ataxia and general paresis were developed, and the diagnosis, with regard to both points, was well established.

The point concerning the extension of the sclerosis outside of the posterior columns into the lateral columns, and remaining limited to the periphery of the section, apparently

in connection with the brain, is exceedingly interesting, as one or two other cases of a similar character which he had examined, previously connected with general paresis, or at least with mental symptoms indicative of that condition or an approach to that condition, presented these same appearances. Dr. Birdsall, in connection with this special pathological change, referred to remarks made by Buzzard on this pathological lesion, to the effect that possibly cases of sclerosis of the posterior column originated in this manner; that is, originated in a meningitis, meningitis having subsided while the changes in the cord have become permanent. He simply wished to bring the point up without committing himself to Buzzard's view on the subject.

Dr. WEBER, of New York, said that he had seen two cases which came under this category, both of which were interesting. The first concerned a gentleman well known, a prominent merchant, who began to suffer from the characteristic lancinating pains of locomotor ataxia when forty-five years of age. These continued for ten years, and were associated with the characteristic features of locomotor ataxia, and from the tenth year of the disease he had been acquainted with the case, and had noticed that there was complete absence of patellar reflex, together with other symptoms, making the diagnosis of locomotor ataxia unquestionable, and there was also evidence that the posterior sclerosis was slowly ascending in spite of all treatment. Syphilis could be safely excluded from the history of the case. The patient finally became blind, showed all the symptoms of dementia syphilitica, and died completely demented. No autopsy was permitted. The second case occurred in a man fifty-five years of age, who died in the Bloomingdale Asylum. There was a syphilitic history. And in the second case also the spinal symptoms preceded the symptoms of peri-encephalitis for five years, but not so well marked as in the first case. Two years and a half ago the patient showed the first symptoms of delirium, and also symptoms of dementia paralytica, which gradually increased, and the patient died as already indicated. In the second case there was for a time the most remarkable amelioration of all the

symptoms under the influence of specific treatment. No autopsy could be obtained.

Dr. MILLS, in closing the discussion, said that he was very glad that Dr. Birdsall had called attention to the occurrence of meningitis in his case, and had also referred to it in a case which he had reported, and also had referred to the remarks of Dr. Buzzard upon this subject. He believed that he had much to learn about diseases of this kind, and he was strongly of the opinion that many of these cases began as perineuritic or meningeal. It is not at all improbable that the first morbid condition of posterior sclerosis is a low grade of chronic meningeal inflammation. He had seen one case in which it was observed thoroughly clinically, and also autopsically. He had seen a number of cases in which symptoms of locomotor ataxia and general paresis were combined, and it is well known that cases of this character sometimes begin with spinal symptoms which apparently progress into the mental condition. He had also seen two cases which began with cerebral expressions and subsequently developed spinal phenomena. He thought that there was an analogous condition pathologically in the cord and brain in this kind of cases. Locomotor ataxia is meningo-myelitis, using the term as we use the term meningo-cephalitis with reference to dementia paralytica, because he thought we should bear in mind the fact of the involvement of the brain in all of these cases. It makes the case more hopeful with regard to treatment, and explanation of the pains which occur so early, if we associate the meningeal element in their production. It had never been absolutely clear to him why it was that this peculiar condition of increase in the connective tissue with diminution of nerve-fibrils should cause early lancinating pains, but it is made much clearer on the supposition that meningitis of some kind, or surface irritation at least, was present, which gave rise to this symptom.

With reference to his own case, there was one weak spot; namely, the fact that the autopsy was not carried out into the peripheral domain for the purpose of determining definitely the condition of the sheath of the nerves and the

nerves themselves. He thought it was particularly true, in cases of syphilitic origin, that they are more likely to begin as a membranous disease along the cerebro-spinal axis proper. As he had already said a year ago, in a paper read before the Association upon an entirely different subject, he believed that syphilis of the spinal cord is primarily, as a rule, an affection of the membranes of the cord. So, also, possibly the first step in the cases under observation was a meningitis. At first he was impressed with the idea that there was a sclerotic process in the lower lumbar cord which gradually progressed until it reached the cerebral surface itself, but he had concluded finally that while there was an evidence of a general process in the cord, there was rather a development of the same process in the various portions of the cerebrum, and that it did not necessarily begin in the cord and ascend by an absolute progression upward.

Dr. W. J. MORTON, of New York, said, with reference to the extension of the disease from the periphery inward, he would like to mention a fact which came to his notice only day before yesterday. It was a case of probable beginning locomotor ataxia, associated with a distinct history of injury of the nerve. The patient, a man, was struck three years ago with a piece of glass which divided the ulnar nerve at the wrist, and several portions of the nerve were afterward removed. The patient is suffering from intense pain, ascending neuritis has been established, as evidenced by atrophy of the muscles and other phenomena, and he came to be treated for the neuralgia and atrophy. In the course of the examination of the case he mentioned the fact that he saw double, and subsequent ophthalmoscopic examination showed that there was actual atrophy of the optic nerve. Diplopia was well established. These points led Dr. Morton a step further, and he found that upon having the patient close his eyes there was a marked swaying of the body, and on attempting to walk there was ataxia, and the ataxia also affected the upper extremities. Further, that the patellar-tendon reflex was absolutely abolished. He did not make special examination with regard to anæsthesia; but with the disturbance of vision, the abolition of the tendon reflex, the

unsteadiness of gait, he believed that a certain form of locomotor ataxia was developed. He mentioned the facts in the case to corroborate the view which Dr. Mills had brought forward, that the disease may begin as a peripheral affection and extend inward.

Dr. WEBBER, of Boston, said he hoped Dr. Morton would examine the patient and determine that locomotor ataxia did not exist before the cut was received, for the mere fact of an unsteadiness, or even ataxic gait, was not sufficient to establish a diagnosis of locomotor ataxia, as it might be a symptom of other affections.

Dr. MORTON said that of course the objection offered by Dr. Webber was a valid one, but he presented the case as one at least suggestive that the injury received five years ago might have some relation to the symptoms of locomotor ataxia which had been subsequently observed.

Dr. PUTNAM, of Boston, said it was strange that the symptoms of locomotor ataxia were especially marked in the lower extremities and not in the upper extremities, while the cut was received in the arm.

Dr. MORTON said he simply presented the case for what it was worth.

Dr. MILLS said he would allude to a view which, perhaps, was fanciful, and which he did not wish to endorse, and that was with regard to the manner in which syphilis produces locomotor ataxia as explained by Granville, who claims that there in some way advances from the original irritative focus of the chancre a neurotic condition that extends to the spinal cord, and absolutely claims that he has made examinations which prove this. While he did not wish to endorse the theory advanced by Granville, of the extension of irritation from the initial lesion to the spinal membranes, he thought, however, from what we know concerning perineuritis and neuritis, the fact of spinal meningitis being a primary step should not be overlooked.

Dr. E. C. SPITZKA, of New York, then read a paper entitled, "Remarks on the alleged relation of speech disturbance and the patellar-tendon reflex in parietic dementia."

At the annual meeting in 1881, Dr. J. C. Shaw read a paper on the tendon reflex in general paresis, which contained the following conclusion: "The exaggerated reflex is closely associated with two prominent symptoms in this disease. Those cases in which there are marked difficulties of speech, hesitancy, stuttering, up to complete inability to speak,—not aphasia proper,—are the cases in which is always found, sooner or later, exaggerated tendon reflex, and it is in those patients who have the marked difficulty in speech and the exaggerated tendon reflex that we find almost invariably hemiparetic attacks, and comparatively rarely epileptiform attacks. There is, therefore, a direct connection between these difficulties in speech, the hemiparetic attacks, and the exaggerated tendon reflex, and this is susceptible of pathological demonstration, and will be the subject of a communication at some future time."

Certainly the suggestions which seemed to open up a prospect of establishing a physiological relation between the speech centers and the lumbar enlargement of the spinal cord would merit our serious attention if the proposition that such a relation exists were made but tentatively. It is stated, however, and very positively, that a direct relation between the disturbance of speech, the hemiparetic attacks, and an exaggerated tendon reflex is susceptible of pathological demonstration, and the author cites a fair number of anatomical examinations (eighteen) made by himself in support of this association. Unfortunately, Dr. Shaw has adopted premises, in drawing his pathological conclusions, which cannot but have tinged his results with a gross source of error, for he has excluded altogether from consideration the pathological condition of the brain. But it so occurs that in paretic dementia we have, as a rule, a diffuse affection of the entire central nervous axis. In some cases the lesions seem to be concentrated and intensified in the cord; in others, in the cortex; and, as Dr. Spitzka had had occasion to observe in a series of fifteen autopsies, in not a small proportion in the brain isthmus. A speech disturbance may be due to a high cerebral lesion, and may then be permanent; it may, on the other hand, be

evanescent, and due to temporary vaso-motor causes. It may not differ in its mechanism, particularly when associated with hemiparetic attacks from speech disturbance following cerebral or meningeal hemorrhage. Speech disturbance may also frequently depend upon lesions in the medulla oblongata. Here, then, are a number of conditions which may in themselves be associated with changes in the tendon reflex. The proof in favor of such a combination as that of the speech function with functions of the spinal cord must be a hundred-fold more overwhelming than that required to establish the relation of a given cortical area to the cortex, or of a special spinal segment to a spinal function. In the latter cases the observations, even if few, are satisfactory to scientists because they harmonize with the presumptions of science. In the former case the alleged relation would conflict with every presumption of science, or rather, the presumption of science is that there are few things in neurology as remote from each other as the tendon reflex and the speech function, unless it be the filum terminale and the olfactory bulb. Dr. Spitzka reported briefly eighteen cases from his private practice, arranged in such a way as to indicate the presence, degree, and character of the speech symptoms, the nature of the initial symptoms, an important factor omitted to be noticed by the proponent of the new theory in the condition of the tendon reflex. In none of his cases was an autopsy made. In conclusion, he stated that he believed that before a relation could be established between the tendon reflex and speech disturbance it would be necessary to have a much larger number of cases than had yet been reported.

Remarks on Dr. Spitzka's Paper.

Dr. J. C. SHAW, of Brooklyn, said he intended, in his paper, to consider the tendon reflex in general paresis as exaggerated, normal, and absent; that he had observed and examined seventy cases, that in twenty-two of these cases he found the tendon reflex exaggerated, etc.; and that it appeared to him there was some relation between these symptoms. He simply made it as a suggestion at the time

he read his paper, and put it forward as a clinical observation. Of course he had not been able to prove it by pathological conditions. At that time he had three brains which he proposed to examine, but unfortunately they became destroyed before they could be submitted to microscopical examination. Since that time he had not seen so many cases as previously. He never pretended to make any such connection between the spinal cord and the speech centres as Dr. Spitzka claimed that he had intended to do.

Dr. PUTNAM would ask a question. Dr. Spitzka had alluded to troubles of speech being due to difficulties in the medulla oblongata, and he would like to ask whether any one has noticed something closely allied to aphasia, due to lesions of the medulla. It at first occurred to him to observe a case of this character in connection, probably, with an aneurism of the vertebral artery, in which there was disturbance of speech something closely like aphasia. He had taken some interest in the subject, and on looking up the matter found that in quite a large number of cases reported by Nothnagel two were mentioned of a similar kind. The fact was merely mentioned by that author, and no special importance seemed to be attached to it.

Dr. SPITZKA said he was present at the time that Dr. Shaw read his paper, and was particularly struck with the view advanced; and he also hesitated before preparing his own paper lest he might have been mistaken concerning the views advanced by the author. He, therefore, looked up the paper as it was published, and found the distinct statement that, "there is a direct connection between these difficulties in speech, the hemiparetic attacks, and the exaggerated tendon reflex, and this is susceptible of pathological demonstration, and will be the subject of a communication at some future time." He thought that these words were sufficient to free him from any suspicion of misrepresentation of the views advanced by Dr. Shaw.

With regard to the question asked by Dr. Putnam, a number of elaborate observations had been made which might answer it. Sclerosis has been found, consisting in a form of crude connective tissue, sufficient even to interrupt

the action of nerve-roots. He could show a number of sections made from the medulla oblongata in which the root was interrupted entirely by a sclerotic patch involving both the hypo-glossal roots and also the origin of the pneumogastric. This patient lost speech entirely, and there were also trophic disturbances which could be referred to implication of the vagus.

The Association then adjourned to meet on Thursday, at 2:30 P.M.

Thursday, second day, afternoon session.

The Association was called to order at 2:30 P.M., by Dr. W. J. Morton, of New York, Vice-President.

Present—Drs. Jewell, Miles, Edes, Morton, Shaw, Sinkler, Mills, Weber, Eskridge, Parsons, Webber, Putnam, Ott, Amidon, Walton, W. A. Hammond, Gibney, Van Bibber, Kinnicutt, Dana, G. M. Hammond.

On motion by Dr. MILES, of Baltimore, the reading of the minutes was dispensed with.

The Secretary reported that the Council had met, and voted favorably upon the thesis presented by Dr. Ralph L. Parsons, of Sing Sing, New York, and recommended his election to membership.

The Vice-President appointed Dr. Ott to act as teller, and Dr. Parsons was unanimously elected a member.

The President, Dr. R. T. EDES, then read a paper on the "Excretion of the phosphites and phosphoric acid as connected with mental labor."

It seemed to the writer that there is a strong popular and scientific opinion that excretion of phosphoric acid is perceptibly or decidedly increased by mental labor; the most common form in which the statement is made being with regard to the increased elimination of phosphorus by clergymen on Mondays. He had not, however, been able to find the statement distinctly made by the original authority, Dr. Holmes. Whether or not it was based upon the statement of Golden-Bird he did not know; but if so, it does that eminent physiologist much injustice, as he does

not speak at all of the elimination of phosphoric acid, but of the deposit of earthy phosphates, and refers to Sunday service, not as intellectual labor, but as bodily exertion and anxiety. The technical difficulties in the way of such an inquiry, if the condition be at all a marked one, are almost none at all, since the determination of the presence of the phosphates with reasonable accuracy was a very simple process. But it is not so easy to make a distinction between mental labor and mental rest a very marked one. We have no accurate scale for mental labor corresponding to the foot or pound of mechanical work done, and it is very obvious that degrees of mental exertion are utterly without correspondence to the value of results obtained. The feeling of fatigue or consciousness of mental effort is, perhaps, the only means that we possess of estimating the intellectual labor. This, it is evident, may as well result from the adding up of a most meaningless column of figures as from the composition of a sonnet. A certain admixture of bodily and mental labor is also unavoidable if any thing like speaking or writing is attempted. There are but a few forms of bodily exercise which are unattended by some sort of intellectual activity, except the most monotonous and invariable employment, like work on a treadmill, sawing wood, etc., so that any observations must be made not only with reference to greater and less, and to the presence or absence of intellectual process; and the person experimented upon can tell better than any one else the degree. Dr. Edes then gave the results of observations made upon himself. The earlier observations embraced only the times of a lecture and a few hours afterward; but, as it might be objected that phosphoric acid forms during the greatest period of mental activity, and only slowly finds its way into the blood and out of the excretory organs, he made a few others in which the examination was made, not only for the evening, but for the succeeding night. In some of these the earthy phosphates were separately estimated, with the result of giving about the ordinary proportion, showing nothing of special interest. From his experiments it was seen that phosphites were dimin-

ished rather than increased during the process of mental action, as, for instance, during a lecture. Would it be fair from these figures to infer that no phosphorus is used up in the process of cerebration? Certainly not; but they are sufficient to show that the amount of phosphates derived from the metamorphosis of brain tissue in a condition of physiological activity is so small, in comparison with that from the system generally, that it has no perceptible effect upon the total of phosphates found in the urine. Is there any reason for the diminished secretion, as found in several of his experiments? He believed it might be easily found by noticing the lesser amount of urine secreted. In a condition of concentrated attention, it is in accordance with all our ideas of physiological activity that the brain should receive a larger supply of blood, and either directly from the withdrawal of this blood from the kidneys, or, as seems to him more probable, from the change in the blood tension and pressure in the kidneys, the amount of urine would consequently be diminished. He had noticed in other, but not recorded, occasions, that the flow of urine after a lecture, or other exercise demanding close attention, had been quite scanty.

Remarks on Dr. Edes' Paper.

Dr. PUTNAM asked how the results corresponded with those which had been found by other observers.

Dr. EDES replied that he had not been able to find any other definite observation; at all events, he had not been able to find any experiments made with this precise object in view.

Dr. MORTON said that the generally received opinion was that the phosphates were increased after mental activity, but if this is an error, as Dr. Edes' investigations seem to show, it would seem that some of the members might throw light upon the subject.

Dr. JEWELL, of Chicago, thought that he could shed little or no light upon the subject, and while he had not made investigations such as those which had been made by Professor Edes, yet he had looked at the matter in the light of common-sense, and had not been able to see why an organ

so small as the brain, even after a tolerably protracted mental effort, should so extraordinarily increase the compounds into which phosphorus enters as to make any great change of the amount found in the urine. The question had frequently been brought up to him in conversation, and his opinion, without any precise foundation for the statement, was that any one who would look at it in its broadest sense might easily see that no such thing would be found. It seemed to him almost absurd, and he was very glad to have this corroboration of his opinion found in the paper read by President Edes. He presumed that he had been asked the question more than a hundred times, mostly by clergymen, and thought that the statement made by Professor Edes, that it was at least a popular opinion, was well founded.

Dr. MILES, of Baltimore, asked if the phosphorus that is detected in the nerve structure is not found rather in the white substance of Schwann than in the protoplasm of the cells. Have we any evidence that there is phosphorus in the protoplasm of the cells? and if it does not exist there, would it not, therefore, be an argument *a priori*, that the phosphates should not be found in the urine as the result of increased mental activity.

Dr. OTT, of Easton, Pa., said that he had made some investigations with reference to phosphates in the urine, but not in the direction contemplated by Dr. Edes. His investigations had been made with reference to the effect produced by drugs, and he did not see how it was possible to arrive at any accurate results with reference to mental action unless similar precise conditions could be obtained. That is, in his experiments he knew precisely how much food was taken, and how much of any drug was administered, and his observations had been made particularly with reference to food and drugs with and without activity.

Dr. EDES remarked that of course such investigations as he had made did not disprove increased elimination of phosphorus from the brain. That might or might not be the case, but there must be a different analysis in such observations than is resorted to in the ordinary analysis of

the urine. All knew that the experiments were open to the criticism made by Dr. Ott, yet he had hoped to cover up, to a certain extent at least, that error; and the fact that in a number of instances the excretion has been less rather than more during mental labor was sufficient to make his case a tolerably strong one.

Dr. S. G. WEBBER, of Boston, then read a paper in which he reported "Cases of locomotor ataxia, interesting on account of unusual symptoms, and on account of marked remission in their course. [See p. 439.]

Remarks on Dr. Webber's Paper.

Dr. G. L. WALTON, of Boston, remarked, concerning deafness in locomotor ataxia, that the cases were extremely rare in which the auditory nerve is implicated, although the idea has been advanced that among the early symptoms of locomotor ataxia we should look for degeneration of the auditory nerve the same as we examine with reference to degeneration of the optic nerve. This view had been advanced by ———, and he had based his opinion upon a number of cases in which he had noticed deafness among the early symptoms. But G———, of Berlin, has strongly opposed that view, and has shown in several cases of middle-ear trouble in which deafness was supposed to be symptomatic of locomotor ataxia, that the disease came from inflammation of the middle ear of itself primarily. Dr. Walton had himself, with a view to studying the subject further, analyzed more than forty cases in which the proportion of deafness was, to be sure, very large; but in the majority of cases occurring in old women in Prof. Charcot's wards, catarrhal inflammation of the middle ear existed, or closure of the Eustachian tube, but in not a single instance could deafness be attributed to degeneration of the auditory nerve. In none of the cases was hearing lost, especially for high tones, as he examined the patients with special reference to this point. In all the cases the hearing was better through the bone on the side on which the hearing was worst, thus tending to show that deafness was due to external lesion rather than implication of the nerve. He

thought we should be very cautious in attributing deafness occurring in the course of nervous disease to that nervous affection. He thought, however, we were a little apt to say that a person is deaf without examining the ears sufficiently. At least, the statement is often made that, in these cases the membranes are normal, but this not sufficient, as it is well known there may be inflammation of the middle ear sufficient to cause marked deafness, and yet the drum membrane be apparently normal.

Dr. JEWELL, of Chicago, wished to make a statement with regard to the curability of locomotor ataxia and the means for securing that desired end. He had now had sufficient experience in that direction to entitle him at least to an opinion held with moderate firmness as to what is the proper course of treatment, and he believed that the most important of all measures to be resorted to in these cases, from beginning to end, is, as nearly as possible, absolute rest of the nervo-muscular apparatus. He was perfectly well aware that he was not stating any thing new, but he was not aware that many of those who treat nervous diseases had become so deeply conscious of the necessity of this measure as he had. It is common enough to prescribe rest, but not such as that to which he referred. Last autumn he had a list of three tolerably advanced cases of the disease; one was of several years' duration, and the patient was unable to leave his house. That patient was put to bed, his room was kept at an equable temperature, and he remained in bed nearly all the time during the entire winter. He never left his room, and when in bed he rested upon the side during the daytime, turning upon his face rather than upon his back when he changed position, and this plan of securing absolute rest was strenuously kept up for six months. At the present time this patient is tolerably advanced toward recovery if you call recovery disappearance of all marked symptoms characteristic of bad cases of locomotor ataxia. With this, as nearly as possible absolute rest, he had also carried out the most systematic massage; and besides, the surface was protected both day and night, so as to keep the temperature absolutely equable, and

thus protect the patient from those vascular perturbations to which such patients are especially liable. Dr. Jewell believed that this method, carried out strenuously and thoroughly with attention to temperature of the surface of the body, also of the room, was the most important single factor of which he had any knowledge in the treatment of this affection. It is not enough, simply to deliver one's self by stating to the patient, "you must rest yourself," for the entire purpose may be defeated through the carelessness of the patient or the patient's friends. A most remarkable case was one which was sent to him by Dr. J. C. Reeve, and in this instance the patient followed this course of treatment for eleven months, and a most astonishing improvement took place. It is true that this absolute rest and passive exercise were not all that was done, but this was the principal line of treatment. The iodide of potassium was also used freely with seances of interruption in the administration of the drug, and some other agents were employed, but the rest and the passive exercise were the important measures. The essential features of the plan were: absolute rest, as nearly as possible; a mild temperature, with the patient at a moderate elevation above the sea-level, say four to five thousand feet; and a thoroughly regulated temperature of the surface of the body.

Dr. W. J. MORTON, of New York, wished to say a word concerning the curability of locomotor ataxia and its treatment. One of the most interesting features of Dr. Weber's report had been the favorable view which he had taken of the progress made in the treatment of this disease. Dr. Morton thought that if any member of this Association had, three or four years ago, advanced the proposition that locomotor ataxia, even in the præ-ataxic stages, could be cured, or even relieved for a length of time, his statement would have been met with a very great deal of scepticism. Only last year he reported two cases of undoubted locomotor ataxia, which he had so relieved that the patients had ceased to suffer from pain, and there was a tolerable amount of return of the tendon reflex, and there followed as soon as the reports were published, most disagreeable comments

by medical journals throughout the country, and the tenor of the entire discussion was, that locomotor ataxia is an incurable disease. Dr. Morton had always been of the opinion that, if locomotor ataxia could be discovered in its tolerably early stages, as the reports of Dr. Webber's cases showed, there is always opportunity for affording a considerable amount of relief. He had always treated them substantially in the way which Dr. Webber had suggested, and nearly always with nitrate of silver, galvanism to the spine, and more recently with hydro-therapy. He had not applied dry cups, nor did he believe that counter-irritation to the spine had ever been of any benefit whatever. He had been much interested in Dr. Jewell's remarks with regard to rest, and followed him up to a certain point with perfect agreement, but when he reached the point of employing massage, Dr. Morton was unable to see how Dr. Jewell was consistent with himself, for the manipulations incident to massage might carry internally a certain number of peripheral impressions, which were the very thing to be avoided. He would like to ask Dr. Jewell if he did not think possibly his theory would be more consistent if he would avoid every source of external impressions which could be communicated inwardly to the spinal cord through the joints, tendons, muscles, etc.

Dr. JEWELL regarded the question as quite a fair one, and thought that he might answer at once by saying yes. If the question is, whether rest alone is the chief condition of recovery, then the more complete the rest can be the more complete will be the cure. He did not, however, himself regard it as all important to stop the impressions from reaching the cord, but simply to stop active exercise, especially of the neuro-muscular apparatus, such as obtains when one is placed upon the feet and is endeavoring to maintain his balance. It is *that* form of activity in the spinal cord which seemed to him to be damaging in such cases; that is, voluntary if you please, or the automatic use of the nervo-muscular mechanism of the cord, not only the co-ordinating but the motor tract. Impressions will come from the skin by rubbing, it is true, but the passive exer-

cise was simply to keep the lymphatic channels and blood-vessels in good condition, and he advised it solely for this purpose, and if it is painful for the patient, one had better be cautious about continuing it. He had found these patients particularly sensitive in regard to physical reflexes; such, for example, as arise from contact with slight currents of cold air or slight changes in temperature, which may produce an aggravation of symptoms that would require days to recover from. Rest was not the only agent to be employed, but he thought it outranked every thing else, and that that plan or method of treatment which would give these parts the most perfect rest, and at the same time give the best circulation, will most facilitate recovery. If a more physiological analysis of the transmission of impressions, such as is produced in massage, should determine that irritation was caused, he would stop it. But he wished, in conclusion, to impress that if this plan of treatment was to be of any service at all it must be done *thoroughly*, and he would like to have the patients at as high an altitude as circumstances would permit; that is, in an atmosphere with a low barometric pressure.

Dr. W. A. HAMMOND, of New York, said that ever since Dr. Weir Mitchell insisted upon the advantages of rest in the treatment of locomotor ataxia, he had enforced it upon his patients as rigidly as possible. He was certain of its beneficial influence, and was able to bear testimony to the very valuable results to be obtained by resorting to it as an adjunct, and perhaps as the chief treatment. He did not know of any thing so essential as rest, and this fact was impressed upon him very forcibly in one of his cases some seven or eight years ago. A man consulted him with locomotor ataxia, whom he advised to go to bed and remain there for at least six months. The case was a very typical one—all the essential symptoms, unnecessary to mention, being present. The patient said it was impossible for him to go to bed, and that if that was absolutely necessary he would be obliged to give up treatment. He accordingly left the office, and when he had reached the sidewalk he slipped, fell, and broke his thigh. Dr. Hammond said he never was

much of a believer in special Providence until that time. The patient was taken home, and for the fracture of the thigh he came under the care of an irregular practitioner, who kept him in bed for nearly a year, and at the end of that time it was found that he was entirely free from his ataxic symptoms, and he had, to his personal knowledge, remained well until the present day. That case made an impression upon him, and he believed that the good result was, so far as the ataxia was concerned, due entirely to the rest which incidentally followed fracture of the thigh. Since that time he had enforced rest as rigidly as possible. It seemed very strange, however, in view of the experience already derived with regard to the beneficial influence of rest in the treatment of locomotor ataxia, that Dr. Granville (?) produces instances of cure obtained with exactly the opposite line of treatment. He makes the patient stand up, balance himself, and practise co-ordination, and he produced numerous instances showing excellent results from this plan of treatment. Dr. Hammond had tried this in several cases, and it had been astonishing to him how much the patients improved. He was not quite sure that it was absolutely safe to rely upon either plan of treatment alone; either excessive co-ordination or excessive rest. He thought that one could take almost any case of locomotor ataxia, a case in which a patient could not stand steadily with the eyes closed and heels close together, and by constant practice he could, after the lapse of a very short time, be able to walk with his eyes closed and stand as well as anybody. That is, his co-ordinating power is capable of being educated up to a very great degree of efficiency.

Again, he had had some experience within the last two years with a plan of treatment by means of the faradic electrical brush. He had treated a great many cases with it, both in clinical and in private practice. He had never known it to do the slightest atom of good, except to relieve the electric lightning-like pains when applied at seances of five or six minutes about three times a week, with one pole along the sides of the spine, and the other pole placed somewhere else.

Again, he thought he could safely endorse what Dr. Weber had said with regard to the efficacy of the salts of silver. He had already published several cases in which nitrate of silver had been administered with decided efficacy, even to the extent of effecting a cure as far as observation had extended; but it is unsafe to assert a cure of locomotor ataxia until the patient has been under observation in a cured condition for several months at least. He had administered the nitrate of silver in doses of from one fourth to one half of a grain, increased gradually, reaching in the course of three or four months to half a grain three times a day. He thought there was one point especially necessary to be borne in mind, on account of the inconvenience which sometimes follows the use of this drug. He had never given it for more than *twenty* days in any one month. After giving it for twenty days stop for ten days, and in that manner his patients had taken it for two years in succession, and he had not yet seen a single instance in which the skin was blackened.

Latterly he had used the terchloride of gold with good results, and he thought that one patient was free from all symptoms; at all events, he had been under his charge for five years, and during the last two years he had been treated with gold, and had improved more under this plan of treatment than he had under the use of nitrate of silver, which was employed for about two years. He is now free from all ataxic symptoms of any kind whatever, except the tendon reflex.

He would like to know something more concerning the plan of treatment by forced co-ordination, and asked if any gentleman had tried Granville's method of treatment. Dr. Granville writes so decidedly that it seemed to Dr. Hammond that he could not make any very great mistake about it. In the cases in which Dr. Hammond had resorted to it, there had simply been an improvement in the ability of the patient to stand with his eyes shut.

Dr. WALTON said he feared he might have been misunderstood with reference to the symptom of deafness in connection with locomotor ataxia. He wished simply to be

understood that the cases in which deafness was present as a symptom of locomotor ataxia, were extremely rare, a fact to which Dr. Webber had already alluded.

Dr. WEBBER said that in looking up the literature of the subject, he could find only a very few cases reported in which impairment of hearing was put down as a symptom of locomotor ataxia, and the conclusion which he reached was that they were very rare.

He did not write this paper with reference to treatment, and what he had said concerning this part of the subject was rather incidental than otherwise. If he had intended to enter upon the subject of treatment of locomotor ataxia thoroughly, he should have impressed the necessity of rest, protecting the skin, etc., very much in the way in which Dr. Jewell had presented it. Dr. Jewell had spoken of rest as the chief element, but Dr. Webber said he perhaps should not put quite so much stress upon that as upon changes in temperature; and it might, perhaps, be somewhat doubtful as to whether, in Dr. Jewell's plan of treatment, even the care taken to prevent the patient from being exposed to change of temperature had not contributed as much toward the cure as the enforced rest, perhaps more so. In the cases which he had reported, the patients, with a single exception, were kept in bed. In that instance the man was sent to California, particularly in order that he might be protected from changes in temperature and the patient thought that the care exercised with regard to exposure to alternating heat and cold was of the very greatest benefit to him. Dr. Webber said he did not know as he should agree with Dr. Jewell, that the patients should always be confined to the bed. With regard to patients practising co-ordination, he thought it should be borne in mind that inco-ordination is only one symptom of the disease, that this may be present in other conditions, and that the symptoms which are seen earliest concern other functions of the body.

Dr. R. W. AMIDON presented a case of *tetanoid paraplegia* occurring in a child, the tetanoid symptoms being preceded by a train of symptoms indicating subacute hydrocephalus.

He made the query whether the central trouble could

not, by causing descending changes in the cord, account for the tetanoid symptoms, the etiology in most cases being obscure.

Dr. Amidon also presented two anomalous cases of *Parkinson's Disease*, the peculiarity consisting in entire absence of tremor, every other symptom of paralysis agitans being present.

Remarks on Dr. Amidon's Cases.

Dr. W. J. MORTON, of New York, would like to place on record an observation which he had made by cutting down upon the sciatic nerve with a view to stretching it, and he found it in an undoubted condition of sclerosis. The nerve was hard, solid, and resembled in feel a piece of gutta-percha, so that, so far as one observation went, it was an absolute fact that the disease, if not of peripheral origin, involved peripheral nerves in certain instances. Curiously enough, the same observation was made by Parkinson when he had described the disease, but his observation had been disputed ever since, and Dr. Morton did not know of any actual observations made upon the nerve which corroborated Parkinson's views, except the one in which he cut down upon the sciatic nerve with a view to stretching. He wished simply to call attention to the fact, and to suggest that true paralysis agitans may be of peripheral origin.

Dr. C. L. DANA, of New York: Dr. Morton refers to the condition of the peripheral nerve, which reminded him of a case of paralysis agitans recently reported, in which the brachial plexus, or rather the three plexuses of the arm, were cut down upon with a view to stretching the nerves, and it was said that the nerves were in a perfectly healthy condition. Dr. Morton's case, therefore, seemed to have been an exceptional one. So far as literature goes, there is no record of changes in the peripheral nerves, as a rule, and if such changes are found they must be rare exceptions, although several observers do make record of some changes in the voluntary motor tract. The entire history of the disease seems to show that it is of central origin, and Dr. Dana could but regard the change in the

condition of the nerve in Dr. Morton's case as an exceptional one, although it was interesting, and possibly might throw some light upon the phenomena of the affection. In cases which he recently saw reported, stretching of the nerves was of no benefit.

Dr. MORTON said he performed stretching of the nerves for paralysis agitans, and some benefit followed, but there was nothing like a cure. Nerve-stretching, however, did more than any thing else usually does. With regard to the criticism offered by Dr. Dana, concerning the exceptional character of his case, he thought that if more nerves were cut down upon, more instances would be found in which sclerosis had taken place, and again, that records of examinations of peripheral nerves in this disease were exceedingly rare.

Dr. PUTNAM, of Boston, referred to a case reported by Westphal, who stretched the nerve with good effect. He would like to ask if any of the gentlemen had found any difficulty in making the differential diagnosis between simple multiple sclerosis and paralysis agitans. It had seemed to him that the cases which he had met with, particularly in the earlier periods, were difficult to distinguish from each other, where either the trembling is not distinctly characteristic of the one or of the other. Certainly in neither case is tremor of a distinct kind, and the fixed look and the fixed carriage of the head were distinctly met with in cases of sclerosis involving the different portions of the cord and brain.

Dr. AMIDON said that in both of his cases the etiology seemed to be the same; that is, intense grief, which of course had been recognized as one of the most common causes of paralysis agitans.

With regard to Dr. Putnam's question of differential diagnosis between paralysis agitans and multiple sclerosis, it might be difficult, but he thought it would be remarkable, to see a case of multiple sclerosis without trouble in the optic nerve, or the presence of nystagmus.

Dr. GIBNEY presented a patient illustrating progressive muscular atrophy with marked fibrillary twitchings. He

also presented a patient with fibrillary twitchings following a gunshot wound.

John D——, aged thirty-two, a cook by trade, presented himself for treatment April 2, 1883, giving the following history, which was necessarily short owing to the patient speaking no language but the Italian.

He gave no family history of any importance; never had rheumatism, and was always healthy and temperate up to the onset of the present disease, except that he says he had syphilis and a sore on the penis in 1872, and speaks of having an eruption afterward.

Two years ago he first noticed a twitching, which, he says, he observed in the muscles of the left half of the body.

One year ago it extended to the right side of the body also.

Six months ago he first observed weakness in the left hand, and he became aware of the fact that it was increasingly growing thin.

At present date the left limbs, upper and lower, are considerably atrophied, especially marked in the hand, the interossei, thenar and hypothenar eminences, and its grasp is decidedly weaker than its fellow.

The muscles about the scapula and back are greatly atrophied.

There are fibrillary twitchings in all the muscles, seeming about equal in degree on the two sides. They are best marked in the pectoral muscles and muscles of the back. No twitching is observed in the muscles of the neck or face.

His general health is fair, appetite not good, bowels regular, etc.

The bladder has never been affected. He complains of tiring easily on exertion, and has noticed within the last few weeks that his back was weak when stooping.

The tendon reflexes are normal. There is no disturbance of sensation, and the special senses are normal.

The electrical reactions show a response to faradism in all of the muscles tested. It is somewhat weak in the muscles of the thenar and hypo-thenar eminences of the left side. In the arms they seem slightly exaggerated, as the muscles respond to a weaker current than is usual, and there is no difference between the reactions of the two sides.

There is response to galvanism according to the normal formula $CCC > ACC$.

The reactions of the muscles of the lower extremities seem to be less marked to both currents than in the upper.

[April 18th there was apparent progress of the atrophy, and the patient was ordered potassium iodide, grs. x, *t. i. d.*, and is taking it at the present time.]

Dr. MORTON then read a paper on, and exhibited an apparatus for, the treatment of "Writer's cramp."

Among the non-fatal diseases of the nervous system there is none, probably, less curable or more disastrous to the patient's occupation, than is writer's cramp. He had obtained better and more lasting results by the method of stretching the muscles affected by the cramps than by any form of electricity. While waiting for more cases on whom to repeat this method of stretching the muscles, Dr. Morton came across a detailed account of the treatment of writer's cramp by the method of Wolff; that is, personal treatment by means of active and passive gymnastics of the hands and arms, massage, friction, and systematic efforts at writing. Wolff's treatment requires about two weeks, but there can be no doubt that he effected a great many remarkable cures. It would be recalled, however, that Wolff's method has met with but little success when carried out by others. Dr. Morton's own belief, based on an experience of two cases of stretching, before Wolff's method was brought forward, is that the sole efficacy of the treatment lies in the stretching of the affected muscles, and that the benefit obtained, though striking, is not permanent, any more than it is in the contractures due to central lesions. Reference was then made to the method of treatment devised by Nussbaum, of Munich, who utilizes the idea of bringing the extensors into play in the act of writing, and thus resting the flexors and abductors of the thumb. Dr. Morton thought that the principle could be applied in a much more simple way than by means of Nussbaum's apparatus, and had therefore devised what was practically a thimble-pen; that is to say, it is a long thimble worn on the entire index finger. To the end of this thimble is attached a stub-pointed pen. The thimble should be of very light, elastic metal, split from end to end, should be made for the finger and clasp it entirely.

A very slight rubber elastic band, such as is commonly used on writing-desks, slipped over the thumb and fingers, serves to steadfast and offer a moderate amount of resistance to extension or abduction. The patient now writes by the usual shoulder movement of free writing, holding the hand flat upon the paper and sliding it along. The natural tendency of the finger and thumb is to extend rather than contract, as in holding the ordinary pen, and the result is that the patient with very little experience learns to write a good hand, and without the slightest experience of cramp or spasmodic movement.

Remarks on Dr. Morton's Paper.

Dr. PUTNAM, of Boston: Dr. Morton's idea is an excellent one, as is also the idea advanced by Nussbaum. Dr. Putnam thought that one objection to the theory of the apparatus is, that we cannot say that simply diverting the tension of the muscles is the essential thing. We cannot assume that the essential nature of the disease consists in an excessive tension or contraction in the muscles cramped, for the electrical excitability of the muscles is distinctly changed, especially in certain of the small muscles of the hand. He thought we should have to wait for some time before such a view could be safely accepted, and before it could be determined how far the shoulder muscles could be used persistently for writing; for, as a matter of fact, he fancied, there were but very few clerks who did not use the muscles of the hands more than the muscles of the shoulder. He also thought it would be a question whether the extensor muscles could be called upon to take this forced position without also suffering. Dr Putnam thought the method of — is most rational, as it aims to bring together all the parts concerned in the physiological action. The statement made by Stein, of Frankfort, was also interesting. He had described a large number of cases treated in this manner, and in a number of instances the results had been most satisfactory.

Dr. WEBBER, of Boston, had had the same experience as had Dr. Putnam with regard to the electrical reactions, ex-

cept that the electrical reaction had been both increased and diminished, but that it is comparatively rare, according to his experience, to find any diminution. There may be a difference in the reaction according to the different periods at which the patient may be seen. He had made a good many observations, and at one time started to write a paper on the subject, showing the irritability of the muscles as demonstrated by electrical reaction. Dr. Morton speaks of his patient as being cured or being benefited. Patients, perhaps, learn to write in that manner, but it seemed necessary to him, before speaking of being cured, first to learn what they can do in the old way; that is, whether the nerves and muscles have recovered their tone and power to again resume work. Until they have recovered power to resume work we can scarcely speak of their being cured, and the mechanical appliance merely aids the muscles which have been affected. Quite a sensible way to overcome this trouble is to have the patient learn to write with the left hand. There is no particular reason why the disease should recur in the opposite hand, although there is a certain predisposition for the patient to have the disease there; but that simply calls for greater caution in the use of the left hand. He had had patients with writer's cramp, who had learned to write with the left hand, and had written quite as well as they ever did with the right hand. An interesting point in writer's cramp is, that it is the smaller muscles of the hand which are first affected, and which give more or less trouble, but the pain is often experienced in the arm *above* the elbow. This fact is interesting as possibly showing that, in the long run, at least in many cases, Dr. Morton's plan of treatment would not be successful. For we must take into account that many times patients have transferred motion from the hand to the larger muscles, and in the course of time the larger muscles have suffered, and then they transfer the trouble to the shoulder, and finally the entire limb becomes disabled.

Dr. WALTON, of Boston, remarked that he did not think it was desirous to bring the flexors into play at all, and he believed that support of the entire hand was an advantage,

and that the apparatus which Dr. Morton had discarded possessed some marked advantages.

Dr. MORTON remarked that if it were a mere question of support it would be a good instrument ; but that if it is necessary to bring the extensors into play, it was not so well adapted for that purpose.

Dr. WALTON : It simply rests the flexors.

Dr. MORTON : I hope to go one point further, and to divert the innervation to the extensors.

Dr. DANA thought that on the whole Dr. Morton's instrument was an ingenious one, and might be applied in a manner not yet suggested ; that is, as a prophylactic measure. He thought the use of an instrument which could divert the muscles would be beneficial, and that this was not only rational, but in accordance with what we know of the physiology of this affection. Dr. Webber had spoken of the fact that the small muscles of the hand were affected first. This is what we should expect, as we know that the innervation of the smaller muscles which regulate the more complicated movements is that which is developed last, and therefore first affected naturally. With this instrument we turn attention to the movements of the larger muscles, and, while there is greater movement effected, it is of those muscles which are not so liable to diseases and degeneration.

Dr. WEBBER said that it might be a question whether these large muscles could take on the necessary movements for fine writing ; there may be some trouble in that direction, as the normal movements or the larger muscles are too extensive for that purpose.

Dr. MORTON said he would like Dr. Webber and Dr. Putnam to say how often they have found actual qualitative electrical changes, but more particularly how frequently have they noticed actual atrophy of the smaller muscles of the hand. In several cases which had come to his notice he had found actual atrophy with reaction of degeneration in the smaller muscles.

Dr. PUTNAM answered that he could not say precisely that there was any atrophy of the muscles ; they were simply softer than normal in one case, and in all three cases

which he had observed, there were distinct qualitative changes in faradic reaction.

Dr. WEBBER remarked that he did not remember to have seen atrophy at all; he had found that the muscles most used in writing, chiefly the interossei and the muscles which move the thumb, were more irritable, and that there was no qualitative or quantitative change, but simply increased electrical irritability.

A paper sent by Dr. E. C. SEGUIN, entitled, "The Insane of Spain, and their Asylums," was read by title.¹

The Association then adjourned to meet on Friday at 2:30 P.M.

Friday, third day, afternoon session.

The Association was called to order at 2:30 P.M. by the President.

Present—Drs. Edes, Miles, Morton, W. A. Hammond, G. M. Hammond, Parsons, Amidon, Walton, Putnam, Mills, Wilder, Birdsall, Dana.

Dr. W. A. HAMMOND nominated Dr. J. Leonard Corning, of New York, for membership. The nomination was seconded by Dr. W. J. Morton, of New York.

The Secretary presented to the Association Dr. J. J. Mason's book, entitled "The Central Nervous System of Reptiles." The book was accepted, with the thanks of the Association.

The Secretary also acknowledged the receipt of numerous copies of *The Alienist and Neurologist*, together with certain reprints, forwarded by Dr. C. H. Hughes, of St. Louis, to the President for gratuitous distribution.

Dr. W. G. HAMMOND, of New York, read a paper entitled "A case of locomotor ataxia cured."

The patient, who was exhibited before the Society, was a man thirty-nine years of age, married, and having two healthy children. Ten years before he contracted a lesion of the glans penis, but it is not known whether it was a chancre or chancroid. No secondary

¹ Published in full in JOURNAL.

symptoms followed. For several years past the patient had been a constant drinker, and two years ago suffered from an attack of delirium tremens. Previous to this event he had been troubled by sharp pains in the legs and some slight unsteadiness in walking, but attributed this to rheumatism. Following the attack of delirium tremens, the symptoms of ataxia were developed. He was unable to stand, either with his eyes closed or open, without support; the bladder was partially paralyzed; the walk was ataxic; anæsthesia was fully developed in the lower extremities; and the tendon-reflex was abolished. The arms were slightly involved, and the eyesight and memory were defective. Dr. James H. Anderson, who was the patient's physician, treated him with iodide of potash and bichloride of mercury, and referred him to Dr. Hammond, who applied galvanism, the faradic wire brush, and the actual cautery to the spine. This treatment was continued for a month with marked improvement. The patient could then walk alone with only a cane for support, and the eyesight and bladder were nearly normal. At the end of this time the electrical treatment was discontinued, as the patient left the city, but the internal medication, previously mentioned, was still persisted in. At the present time, after being under treatment about eighteen months, the patient is perfectly well. He can stand and walk with the eyes closed, and get on and off a car while it is in motion; the power of the bladder is restored; the anæsthesia has disappeared, and the tendon-reflex has returned.

Remarks on Dr. G. M. Hammond's Case.

Dr. F. T. MILES, of Baltimore, had seen one case with ataxic symptoms to an extravagant degree. The patient had an acute attack, as it might be called; all the symptoms appearing almost suddenly. He had lost the power of co-ordination to the extent of stumbling about the room, the tendon-reflex was entirely lost, and there was inability to stand with the eyes closed, etc. He had had specific trouble some time previously, and Dr. Miles, seeing him in consultation, advised a prompt and decided course of treatment by the use of mercury. The patient was a policeman, and was obliged to give up his position on the force. Some months afterward, Dr. Miles was asked to sign a petition to restore him to the force, and when he came to examine the

patient he found that all of his previous symptoms had been entirely relieved. It was an acute case, and one might be led to suppose that some specific trouble of a local nature occurring upon the membranous part of the cord, perhaps, had taken place, given rise to the symptoms, and had yielded to the prompt and decided treatment by mercury. He would not call it a case of locomotor ataxia, but probably some gummous formation had produced the inco-ordination of the limbs, which disappeared promptly under the anti-syphilitic treatment.

Dr. PUTNAM said that Dr. Hammond's case recalled to mind interesting cases in which a post-mortem had been made, and reported by Schulze, also by Erb, in which recovery from locomotor ataxia had taken place. At these autopsies the characteristic lesion of locomotor ataxia was found, but the clinical history showed that the tendon-reflex had returned.

Dr. F. T. MILES, of Baltimore, then reported a case illustrating "Nutritive alteration in the hand from pressure of the head of the dislocated humerus in the axilla."

The case was interesting for the following reasons: First, on account of the great deformity, the glossy skin, insensibility not only to touch but to heat and cold, loss of power in the muscles, with great deformity of the little and ring fingers; second, all these symptoms came very slowly as a result of pressure of the head of the humerus into the axillary space; third, that the pains were entirely limited to the shoulder; fourth, that the condition of the hand appeared so gradually that the patient knew but little concerning it.

Dr. MILES was impressed with the fact that the expression neuritis, called to mind a tender and swollen nerve, a great pain upon touch. He thought, however, that if we looked into the subject more carefully, there would be found various forms of neuritis capable of altering the function of a nerve without producing marked subjective phenomena; that neuritis may go on without absolute pain, and may produce alterations in tissue without giving

rise to many of those symptoms which we have usually expected should be present when a nerve is inflamed. He thought that many cases were regarded as having their origin in central trouble when there was alteration of tissue within the nerve itself.

Dr. BURT G. WILDER, of Ithaca, then read a brief paper on "The brain of a cat lacking the callosum."

Although there have been recorded several cases of more or less nearly complete absence of the great cerebral commissure with human beings, the specimen exhibited (with photographs) seemed to be the only case of the kind among the lower mammalia, being the only case occurring in the anatomical laboratory of Cornell University among the several hundreds of cat's brains there examined. There was no trace of the callosum, nor of the fornix beyond the dorsal limits of the portæ (foramina Monroi); the præ-commissure and medi-commissure are larger than usual. Unfortunately, nothing whatever was known of the history or habits of the cat. Now that the unique specimen had been submitted to the Association, Professor Wilder will feel more free to dissect it.

Dr. W. J. MORTON asked what peculiarities in mental activity the human being would present under the same circumstances.

Dr. WILDER answered that that was a question which Dr. Morton, as a human neurologist, should be better able to answer than himself. There was one case at least on record, and the only peculiarity noticed in that patient was that he was exceedingly quarrelsome and dirty.

Dr. MILES, of Baltimore, said he had a specimen in his collection in which a mass, apparently malignant, occupied as far as possible only the situation of the corpus callosum, and the only symptom which the patient presented in that case was an exceeding slowness in reply to questions,—a marked torpidity. His intellect was not so much disturbed, but it took him about four times as long to answer a question as it did the ordinary healthy person.

Dr. WILDER then read another brief paper on "The

alleged homology of the carnivoral fissura cruciata with the primatial fissura centralis."

Referring to the assumption of T. Lauder Brunton (*Brain*, Jan., 1882): "That these fissures correspond," Prof. Wilder made the following suggestions:

1. Writers should specify whether by correspondence they mean *analogy* or *homology*, as a relation based upon the position of a fissure fixed its location among experimentally determined "motor areas," or a relation implying identity as determined by embryology and comparative anatomy.

2. The present disagreement of competent authorities respecting the homology of these two fissures should restrain both physiologists and zoölogists from assuming the correctness of any particular view; for example, the human centralis has been homologized with not only the cruciata but the superorbitalis, the coronalis, and the unciata, together with the coronalis (in connection with the last idea was shown a foetal human brain exhibiting the somewhat rare condition of an interruption of the centralis); the cruciate has been homologized with not only the centralis but with the first frontal, the calloso-marginalis, and the occipito-parietal; *i. e.*, the surest method of determining the true homology seems to be the one which is outlined in Wilder & Gage's "Anatomical Technology," to make careful and extended comparison between the brains, especially foetal specimens of man, monkeys, and the *lemurs* on the one hand, with those of cats, dogs, and seals on the other.

The lemurs are primates with some characters of the carnivora, while the seals, though carnivora, have the occipital lobe and the post-cornu of the procœlia (cornu posterius of the ventriculus lateralis.)

Remarks on Dr. Wilder's Paper.

Dr. W. R. BIRDSALL, of New York, would like, from the statement just made by Dr. Wilder, to hear his opinion as to whether we really can arrive at such conclusions as he had indicated. In other words, suppose the homology of the convolutions in different animals is established, can we

conclude that similar areas correspond physiologically. May not, in the development of certain classes of animals, development of function go in such a different manner that certain convolutions acquire physiological properties entirely different from what we would find in other animals, and still certain anatomical appearances remain the same. In comparing physiological experiments upon different classes of animals in cortical areas, he thought this possibility should be borne in mind. Within certain limits this must be the case, and perhaps this is the general view held.

Dr. WILDER said that Dr. Birdsall's remarks brought up the entire question as to the criteria or tests of homologies. Whatever results had been obtained by irritation of the cortical surface of the brain, were to a certain extent begging the question, because it was not the result of such processes as enabled us to trace the fibres of the nerve-substance, and it was therefore premature to form any positive opinion from the fact that certain phenomena corresponded to the irritation of certain areas on the surface of the brain in the dog and cat. In the second place, it would also be of great advantage could this be done, because we could give to these areas the same name. The special points which he wished to make in his paper was, that whatever results could be reached by physiologists, they should be held in abeyance, so far as saying that certain fields are analogous to corresponding areas in man, until we have a series of brains to determine what their homologies are.

Dr. W. A. HAMMOND, of New York, said the subject was so vast that we have not yet ever been able to determine the homology of individuals of even the same species. Take, for instance, the case in which a man is injured upon one side of the brain, and certain symptoms are developed. The same injury in another man's brain, and so far as can be ascertained, in a corresponding area, may be followed by an entirely different set of symptoms. To open the question of homology in different species would certainly lead to interminable discussion. At all events, the question propounded cannot be answered at any one session of such an Association as this.

Dr. MILLS, of Philadelphia, said he had seen several instances of incomplete central fissure in man, out of a very large number of observations. He would ask Dr. Wilder whether he had seen that very infrequent condition of incomplete union of the Sylvian fissure with the fissure of Rolando, of which a few instances had been reported, and of which he had seen one himself in man. He would also refer to the comparatively numerous cases of such union reported in the work of B——, which led Dr. Mills to think that that author's observations were not reliable in this respect. At all events, up to within one or two years, only five or six cases of this kind had been reported.

Dr. WILDER replied that he had not seen any such cases.

Dr. BIRDSALL continued that he did not wish to have it understood that his suggestion had any thing to do with the general work which Dr. Wilder has undertaken. It seemed to him that the question is extremely difficult, but that the only true basis is to establish homology between the different classes of animals with regard to fissures and convolutions, but, after all this has been done, can it be assumed that the same motor areas in one can guide us in the other?

Dr. W. J. MORTON, of New York, then read a paper on "The treatment of migraine," in which he stated that the object was not to add any thing in the way of a specific remedy, or other isolated therapeutic measure, but rather to inquire, on the basis of certain accepted and familiar facts, if the present disjointed assaults upon the disease may not be organized into a systematized method of treatment.

Dr. Morton thought that this could be accomplished on the vaso-motor theory of the disease. The intense pallor, the cord-like and throbbing temporal artery, the shrunken appearance of the eye, and the dilatation of the pupil, all on the affected or painful side of the head, favor the theory that the symptoms may be explained, at first suggested by DuBois Raymond, by the existence of a contraction of the muscular walls of the blood-vessels of the affected side.

Mollendorff, later, brought forward the opposite theory :

that the symptoms of ordinary migraine were due to "debility of the vaso-motor nerves governing the carotid arteries, whereby the artery is relaxed and an arterial fluxion to the cerebrum is established."

An instance of this type of the disease may be found in a case reported by Berger in 1874. This report leaves no doubt as to the clinical distinctness of the paralytic form of attack.

The views of DuBois Raymond and Mollendorff have been sustained by Eulenberg, Erb, and others.

In the vaso-motor theory, then, we find a definite working basis for the practical treatment of the disease; a basis on which clinical observation and experimental physiology are singularly in unison.

The diagnosis of the type, then, not the simple diagnosis of the disease itself, determines the treatment, often by diametrically opposed measures or remedies.

The rule is, that the primary condition, be it a spasm or paralysis, is a continuous one,—at least during the prodromatic stage, and during one third or one half of the attack. There is, therefore, little difficulty in deciding against which form we shall direct our treatment.

One common source of error is in mistaking, generally from the patient's account of it, the *secondary* redness that follows the spastic onset for the *primary* redness that initiates the paralytic onset of the attack.

The initial pallor or redness may be of short duration (five to fifteen minutes), and yet be followed by a long-continued headache (twenty-four hours).

Dr. Morton believed it would be generally found that the spastic type is, by far, more common than the paralytic.

The most reliable treatment for the spastic type is the administration of sixty grains of the bromide of *sodium* at the very outset, repeating in an hour and a half, if the attack does not cease. We had seldom failed to abort the attack in this way. The patient must then be put upon a course of the same remedy, taking fifteen grains, three times a day, for from three to six months, with cod-liver oil, iron (Blaud's pills), maltine, etc., according to indica-

tions. The exceptional cases which are not relieved by this plan of treatment—practically cured—are those confirmed instances of migraine existing generally from childhood. The *sodium* bromide, as compared with the *potassium* bromide, is comparatively innocuous.

A practical objection, frequently offered, is that “the bromide reduces the quantity of blood in the brain, and why, therefore, do you use it in the spastic type when an anæmia already exists?” The fact brought forward must be admitted, that under the influence of bromides, the quantity of blood circulating within the cranium, is greatly diminished.

Dr. Morton's answer to the objection was, that in this spastic type, paradoxical as it seemed, the bromide actually increased the amount of blood in the brain, over and above the previously existing ischæmic state due to spasm of the vessels. This it probably does by depressing the excitability of the irritated vaso-motor mechanism; the vessels relax, an equable circulation is established in place of the local ischæmia, supposed to be present at the bottom of the migraine.

Nitrite of amyl and glonoin (nitro-glycerine). The use of these remedies seems to be justified by clinical experience. The spastic attack of migraine has often been relieved by nitrite of amyl, yet, undoubtedly, the effect is transient. Nitro-glycerine, therefore, is preferable to nitrite of amyl, because its effects are more lasting. In some cases it is remarkably efficacious. Recent investigations seem to show that more even effects of the drug will be obtained when administered *after* than when given before meals. The dose may be gradually increased from *one drop* of a one-per-cent solution, three times daily, up to four to six drops, three times daily, particularly if taken *after* meals. It probably acts by subduing the irritability of the vaso-motor centres. The bromide may be given *before* and the nitro-glycerine *after* meals, in the same case, and not infrequently with decided advantage.

The angio-paralytic type. The vaso-motor centres are in a depressed state, and may, theoretically, be called into ac-

tivity by strychnia, given in increasing doses until full physiological effects are produced. But the chief remedy is ergot. Its action is to produce vaso-motor spasm. A large dose, either by the mouth or hypodermically, may abort the attack. The effect of such doses is sometimes remarkable. Subsequently the drug is to be used continuously. To these measures may be added the use of the actual cautery and electricity. By many, migraine is regarded as a peculiarly intractable disease. To Dr. Morton, however, the disease seemed to be one that is curable. It requires merely a clear diagnosis concerning its type, and a somewhat long-continued and carefully watched course of treatment.

Remarks on Dr. Morton's Paper.

Dr. W. A. HAMMOND, of New York, said there was one point to which Dr. Morton had not alluded with reference to diagnosis, and it was the difference of temperature which exists upon the two sides of the face ; that is, in the paralytic variety, the temperature of the external auditory canal is usually about two degrees higher than upon the opposite side, while in the spastic variety it is as much as that lower than normal. This is a simple means of determining what kind of migraine we have to deal with. It is unsafe to rely upon the dicta of the patient in this respect. A gentleman consulted him for migraine, and, from the symptoms which he gave, Dr. Hammond was satisfied that it was a case of the paralytic variety, and treated him accordingly, and to his great surprise he was made worse by every dose of medicine which he took. He then changed the treatment, gave the patient glonoin, and an attack of migraine had not been developed since. He administered one drop of a one-per-cent. solution three times a day. He would ask Dr. Morton how he would treat a case where the paralytic variety existed upon one side and the spastic variety upon the other side ? He had seen two such cases and had found them very troublesome, and he had not succeeded in curing them. Several such cases had been described.

Again, he thought Dr. Morton should have laid some stress on the use of strychnine in the paralytic variety, which

he thought was more valuable than ergot. It should be administered in gradually increasing doses, beginning with one fortieth of a grain, and carrying it up to one half a grain, three times a day.

Dr. Hammond also thought it true that while the spastic variety occurred much more frequently than the paralytic, the paralytic variety is met with in quite a large proportion of cases.

Dr. PUTNAM, of Boston, had seen two cases of severe headache not corresponding distinctly to the type of migraine, one being associated with chronic albuminuria, from which the patient suddenly died, and the other was associated with latent gout. In these cases large doses of the bromide were of decided efficacy in warding off the attacks, which were probably not due to the effect upon the blood-vessels, as he had repeatedly endeavored to determine the existence of vascular derangement.

Dr. J. LEONARD CORNING, of New York, on invitation, said that he had treated several cases of migraine, in some of which he had afforded relief, and in others he thought that he had done a great deal of harm. One special plan of treatment he had tried with a certain degree of efficacy; namely, compression of the carotids to diminish the supply of blood to the brain. He had carried out some ten or fifteen such experiments, and thought that in one or two instances he had obtained some good results. With regard to bromide of sodium and potassium, he thought the sodium was better borne than the potassium. With regard to physiological effects produced by the bromides, he thought that the theory that they produced anæmia of the brain had been absolutely established by the experiments performed by Dr. Hammond. He thought that the anæmia of the brain produced by the bromides continued so long as the physiological effects of the drug persisted.

Dr. WILDER remarked with regard to compression of the carotids, that he had tried it upon himself during one severe attack of hemicrania, so severe that he could not refrain from crying out on account of pain. He applied compression to the carotid upon one side, and it gave very marked relief.

Dr. W. A. HAMMOND said, then certainly you had the paralytic variety, according to Eulenberg's test, who states that compression of the carotids increased the severity of the spastic variety, whereas the paralytic variety is immediately benefited by it.

Dr. MILES, of Baltimore, referred to the fact that the two varieties might occur in the same patient upon the same side.

Dr. DANA, of New York, referred to the fact that sometimes we have symptoms attending disturbance of the optic nerve, of the fifth nerve, and, besides, cerebral symptoms, and also symptoms pointing to some disturbance of the vagus; and it seemed to him rather strange that a cut-and-dried treatment, based upon the spastic or paralytic condition of the arteries, should be the only one which should be prominently put forward. He had not been able to distinguish between the spastic and the paralytic forms in many cases. Possibly it was because he had not applied some of the tests referred to. He thought it a common experience that very often you do not get the typical contractions and dilatations of the blood-vessels, and it seemed to him that the vaso-motor system is not the sole point of attack, and might it not be that the pain is the cause of the vaso-motor disturbance as well as an effect? He had used cannabis indica with very good results, administered when the attack is coming on, in doses of one drop of the fluid extract every five minutes. Paullinia also had proved serviceable in his hands for warding off the attacks. Nitrite of sodium had also been said to produce similar effects, as does glonoin. He would like to know whether any of the members had used nitrite of sodium, for there was something the matter either with the salt or with the American constitution, according to his experience, as he had seen dangerous symptoms produced by twenty-grain doses, and also very disagreeable symptoms produced by five-grain doses.

Dr. W. A. HAMMOND said that he had administered the nitrite of soda in twenty grain doses in epilepsy, and it had seemed to be perfectly inert.

The President referred to a recent paper published, as he recollected, in the *Practitioner*, in which the writer spoke of

the impurity of the drug and the uncertainty of its effects.

Dr. MILLS, of Philadelphia, at the suggestion of Mitchell and Reichert, used nitrite of sodium in epilepsy, and in every case with bad results.

The President remarked that he had had the impression that the active principle in all three agents, the nitrate of amyl, the nitrite of sodium, and nitro-glycerine, was the nitrous acid.

Dr. PUTNAM, of Boston, said he should be inclined, on general principles, to agree with Dr. Dana, that too much stress had been laid on the vascular condition in migraine. We are all aware that changes in the vascular supply is a frequent condition in many neuralgias. In his own case the first sign was almost invariably pain, followed by changes in the size of the pupils. Sometimes these symptoms were accompanied by vomiting. He could not say that any signs absolutely distinctive of migraine existed as distinguishing it from the more superficial neuralgias of the fifth pair, yet no one thinks of ascribing as a cause of an ordinary headache the vascular condition as the point to be attacked in its treatment, nor did he see why it should be done with migraine. Certainly treatment with cannabis indica had proved successful in the hands of a number of persons.

Dr. MILLS, of Philadelphia, said with regard to the vascular condition, that he thought there was no doubt concerning the existence of the two varieties mentioned, but the condition producing migraine is something behind vaso-motor processes, and this, whatever it may be, will help to account for the success which Dr. Morton obtained in some cases with apparently different forms of treatment; bromide of sodium acting, as it has done, by relieving the irritability of the centres concerned in the spastic condition, and glonoin acting, perhaps, to produce the same effect in a different way. Perhaps hearing so much about spastic and paralytic conditions we may make a compound of them, but there is not necessarily any connection between them. Take, for example, a common illustration: a patient has been using nitrite of amyl, having a decided vaso-motor spasm, which condition is not accompanied by pain. However, that we

have the angio-spastic and the angio-paralytic varieties there is probably no doubt.

The President said he had had some experience in the use of two or three remedies in his own case, in which the pain, as a rule, originates on the right side, about the eyes, and after a time extends all through one side of the head, and he could testify to the great relief which might be obtained by the use of bromide of potassium. He had always used potassium, for the reason that it affected him favorably, and he therefore did not wish to change. With symptoms indicating the approach of an attack, he took a large dose on going to bed, and it usually warded off the attack, and he had also tried it in the daytime, and it had given him almost certain relief. He had taken as much as one hundred and twenty grains at a dose.

As to the theory of the two kinds of headache, he had not determined which in his own case existed. He could sympathize with Dr. Putnam and Dr. Dana in their view that the condition of the blood-vessels is a side phenomenon rather than the essential element, so far as pain is concerned. He had also seen illustrations of the fact mentioned by Dr. Mills; namely, a change of the kind of headache upon the same. Guarana owes its efficacy, perhaps, almost entirely to the caffein which it contains, and he had therefore administered caffein with great efficacy in many kinds of headache, and had seen it in some instances act as speedily as subcutaneous injections of morphine. In some of his cases it almost invariably gives relief for a few times, from three to six, or eight times, and afterward it fails altogether. But he should not think that the failure of a drug upon one occasion would be sufficient to warrant him in changing his diagnosis with regard to the form of headache which existed.

Dr. WILDER called attention to an observation upon himself. He had the toothache, and he noticed that the throbbing pain alternated with every beat of the heart; that is, every other beat of the heart caused exacerbation of the pain, and the pulsations were so marked that he could pick up the rhythm by the beats. This, so far as it went, indicated that there were two seats of the vaso-motor centres

capable of acting alternately. He would like to ask whether a like phenomenon had been observed by any of the gentlemen.

Dr. HAMMOND suggested that the pulsations of the heart were not of equal force, and that the alternate heart-beats only were sufficiently forcible to produce the pain.

Dr. MORTON said, with regard to temperature, that in his paper he called especial attention to it, and the same with regard to strychnine. With regard to the case mentioned by Dr. Hammond, the man who took glonoin, it was a surprising result, for the patient stated distinctly that it was the first time for three months that he had been free from pain.

Dr. Morton had not seen migraine of different types upon different sides of the head. Dr. Hammond had asked how he would treat such a case, and he would answer it by saying that in accordance with the doctrine that the descending galvanic current produced contraction of the blood-vessels and the ascending current dilatation, one current could be applied to one side of the head and the other current to the other side of the head. The effect of this, however, would be highly problematical.

With reference to nitrite of amyl, nitro-glycerine, and nitrite of sodium, he thought it was quite correct that the effects produced by these drugs were due to the nitrous acid, the only difference in the effects being due to the rapidity with which decomposition took place, and with which the nitrous acid is liberated. In nitrite of amyl decomposition takes place most rapidly, in nitro-glycerine next, and in the nitrite of potassium and nitrite of sodium it occurs later.

There seems to be a disposition to consider that the condition of the blood-vessels is not a fair guide to be followed in the treatment of the disease. His idea in writing his paper was to meet exactly that objection, for he believed that with such lack of certainty there was no end to experiments, and we should not be able to reach any definite results; whereas, if we adopted a definite plan of treatment, based upon a definite physiological condition, we can give a negative answer if not an affirmative one, and, after all, the vaso-

motor condition is one of the prominent features in the affection. He thought that if the gentlemen would take some trouble to examine the differences in temperature upon both sides of the face and head, the effect produced by pressure of the carotids, the condition of the eye with reference to the sensitiveness of the ball, that they would then easily make a differential diagnosis, and perhaps obtain better results. It seemed to him that the vascular condition was a far more decided guide than the simple symptom of pain.

Dr. W. R. BIRDSALL, of New York, read a paper entitled "Statistics relating to the association of syphilis with locomotor ataxia."

The material on which his own statistics are based consist of forty-two cases of locomotor ataxia, observed at Professor Seguin's clinic for nervous diseases at the College of Physicians and Surgeons, and in his services at Manhattan Hospital, New York; also in his own service at the latter institution. The number of cases reported does not represent the whole number seen at the above-named institution; the older cases having been excluded, and many later ones, from no mention being made of the presence or absence of syphilis, or on account of an otherwise imperfect history. In the forty-two cases there were but four with a previous history of syphilis (9.5 %).

The following table exhibits the reports of different observers.

	Number of Cases of Locomotor Ataxia.	History of Syphilis.	Per Cent. Syphilitic.
Birdsall	42	4	9.5 %
Rosenthal	105	18	12. "
Bernhardt	37	9	25. "
Remak	52	13	25. "
Westphal	75	24	33. "
Puċinelli	51	22	44. "
Gowers	33	23	70. "
Fournier	30	24	80. "
Erb	100	88	88. "
	525	225	43 %

The view that syphilis is a frequent etiological factor in locomotor ataxia gained support, not from the data of patho-

logical anatomy, or from therapeutical results, nor even from a comparison of the symptomatology of the two affections, but almost exclusively from statistical data, showing that locomotor ataxia has followed syphilis naturally; we must determine whether syphilis is in fact more frequently associated with locomotor ataxia than with all other diseases, under similar conditions, before attempting to show causes for a more intimate relationship.

Concerning the first point, the statistics of certain writers seem to decide this question, beyond doubt, affirmatively, while others point as strongly toward a denial. We have, in short, to deal with the dangers and difficulties of statistics. Among those applicable to the problem in question are, the difficulty of determining whether the patient ever had syphilis, and if he had, whether the early symptoms of locomotor ataxia may not have antedated the syphilitic infection; also the difficulty in excluding from true cases of systematic sclerosis of the posterior columns, cases of combined posterior and latent sclerosis, disseminated sclerosis, myelitis of limited extent, primary or secondary to tumors, meningitis, etc. Granted that these difficulties have been surmounted, which will depend largely on the care exercised by the observer, and perhaps, unintentionally, upon his preconceived ideas of the problem, still, such statistics must vary also with the character of the material under observation depending on variations in the value of such factors as nationality, social condition and morality, occupation, sex, age, etc., between different observers.

Again we have no standard as to the percentage of syphilis to all other diseases, which must also vary exceedingly under different conditions.

Erb has calculated that twenty-five per cent. represented the correct number in the material upon which his statistics were based.

The statistical method, although it ought not to be ignored, is thus seen to be unreliable, particularly when the number of cases observed is as small as we find it respecting locomotor ataxia. Certainly, no conclusions could be drawn with safety from any one of the small group of cases

of the different observers, and even the aggregate number is much too small as yet to lead us to conclude that the high percentage (43 %) represents any approach to a constant one. We must wait for more cases before we can trust the slight corroborative evidence which the statistical method may be able to give for or against the different theories of the relation of syphilis to locomotor ataxia.

Dr. Birdsall also exhibited an electrode for making careful electrical tests, and also for therapeutical purposes.

Dr. Birdsall exhibited a new universal electrode handle and combined current-reverser and interrupter, which he has designed to avoid the inconvenience of using the pole-changer of the battery, or of moving the electrode when it is desired to make careful polar tests for diagnostic purposes, or reversals of the current for therapeutic effects.

Instruments of a similar character have been devised, but most of them are too clumsy for convenience, and there is danger with them of reversing the current when it is not desired. In this instrument the current is entirely under the control of one hand of the operator as regards the making, breaking, and reversal of the current, and he expects to be able to regulate the strength of the current as well by the addition of a rheostat which will not change the compact size and shape of the present instrument.

Another feature consists in its being a universal handle in which the screw has been dispensed with, and in which a slightly tapering cylinder fits into a corresponding tube on the different-sized electrodes, allowing them to be changed with great ease and rapidity. The latter are deeply grooved on the circumference to receive an ordinary gum-elastic band, which secures the cover of sponge, chamois, canton flannel, or absorbent cotton, so that they may be readily changed when soiled.

Remarks on Dr. Birdsall's Statistics concerning Syphilis and Locomotor Ataxia.

Dr. MILLS, of Philadelphia, thought it impossible to settle this question by statistics. On the other hand, he thought it was absurd to assert that locomotor ataxia is

always due to syphilis, as Erb had done. He felt sure that he had had a considerable number of cases of locomotor ataxia which were not due to syphilis.

The Association then adjourned, to meet at 8:30 P.M.

Third day, evening session.

The Association was called to order by the President.

Present—Drs. Weber, Walton, Amidon, Birdsall, Miles, Morton, Mills, Spitzka, Parsons, Wilder, Dana, Edes.

The Secretary announced a communication from Dr. Schmidt, of New Orleans, on "The pathological anatomy of the cerebro-spinal axis in a case of chronic myelitis of nineteen years' standing," accompanied by elegant lithographic engravings, and to be printed in Dr. Morton's JOURNAL. The communication was accepted.

The Secretary also reported that the application of Dr. Corning for membership must lie over until another year, for the reason that none of the members of the Council were present to take action upon the thesis.

Dr. C. L. DANA, of New York, then read a paper entitled "Note on the treatment of chorea by the sedative galvanization of the brain."

Remarks on Dr. Dana's Paper.

Dr. MILLS, of Philadelphia, said Dr. Dana had remarked that he believed there was chiefly a direct action upon the brain. While he agreed largely with Dr. Dana concerning the efficacy of galvanism, he hardly thought that Dr. Dana had logically explained himself with regard to the method of its action. For, his allusions to the common polar method, and then that the action was chiefly a direct one, were hardly consistent. There were many things which led him to think that the effect, so far as the cerebrum is concerned, is indirect, and a reflex one. With the method of using the foot electrode for a cathode, and the large anodal plate placed over the cranium, he could scarcely see how Dr. Dana would regard this as a direct method; for, as Dr. Mills

understood it, it is a question of direct transmission of the current through the brain, or a question of transmission by way of nerve-trunks, and so producing an action upon the brain. If we use a foot rheophore, and then have the other applied to the head, in what way is the circuit completed through the brain? It is much more reasonable that it is transmitted by way of the trigeminal fibres, perhaps, and thence there is radiation of impressions from that point which yields a certain effect; that is, there is a sort of extra polar diffusion of the current from the anode. In the common example of having the patient hold one electrode in one hand, or applying it to the spine, and the other to the lower jaw, you will produce almost instantly, at least at the making and breaking of the circuit, vertiginous effects, and this is a cerebral effect, and he did not see how it could be regarded as direct transmission, if he understood the matter as Dr. Dana had expressed it. Dr. Mills' own impression was that the current applied in these cases had a limited amount of efficacy, but that it was much more an inhibitory or a reflex effect which was brought about by the use of the current in this way.

Dr. WEBER, of New York, had made a large number of applications of galvanism to the brain in adults as well as in children, with well-working batteries, and he had found, at the utmost, that three elements were sufficient to produce effects which we wish, without the unpleasant effects; and for grown persons, from four to six, at the utmost eight elements, would be sufficient when the current was passed with the anode placed upon the forehead and the cathode to the neck, and this could usually be used without unpleasant symptoms. It had been his experience that but few elements were necessary to produce vertigo when the rheopores were applied to the temples, but more will be borne when applied to one side than the other, of the head. As to the effects produced by galvanization of the brain, there is a refreshing effect, particularly in his own case, in the early morning before breakfast. As far as the direct action is concerned, he agreed with Dr. Mills that the reflex is probably the one most important that we have to consider. In

neurasthenia, galvanization of the brain is almost always followed by pleasant results.

In regard to the second part of the paper, he had had some experience, and so far as the effects were concerned which he hoped to get from the application of electricity in cases of chorea minor, he had failed to see any. When he supposed that he had obtained effects it was when he had treated the disease at the same time with arsenic in gradually increasing doses. Therefore, he thought it would be necessary, before we could form any conclusion that galvanization of the brain will do any good at all, to have a large number of cases in which nothing else is used except electricity. When used in conjunction with arsenic he was of the opinion that it was the arsenic which produced the beneficial result.

Dr. W. R. BIRDSALL, of New York, thought it was unfortunate, in distinguishing the effects produced by the current upon the brain, that a better method of comparison is not used. The number of cells is referred to, a statement which gave us but little idea as to what the exact effect could have been. He regarded this as an exceedingly important point with regard to comparison, so far as the effects were concerned, in reporting cases, and in making comparisons as to parts under examination. With regard to the polar action of the current, it was exceedingly difficult to recognize the differences in polar action while we are using electricity upon the human body, where the resistance is so enormous. He could conceive that the effects which Dr. Dana described could be produced. Further, he thought that there was often an attempt to reduce the effects of electricity to definite laws when we are really not in a position to do so. He wished to speak merely on general principles. It is a complex question, and it is difficult to eliminate many points which had been raised this evening, such as the effects produced internally, and even the effect produced upon the imagination of the patient. Respecting the use of galvanism in chorea, he had had some experience, but it had been rather unsatisfactory, and of late, in hospital work, he had not used galvanism in its treatment, because such

very satisfactory results had been obtained from the use of arsenic in gradually increasing doses, associated with rest, that he preferred this method to all others which had been previously used.

Dr. BIRDSALL said he wished to correct what seemed to be a misconception. He did not refer to this matter with regard to the discussion in connection with Dr. Dana's observations, but in regard to the direct effects of the current, and stated that he thought he would have a better method of comparison by the use of such instruments of precision as a galvanometer, than by the simple statement that a certain number of cells were used. If we are to determine the physiological effects of the galvanic current we must have some guide as to its strength, and must know something as to the force of the cells. The fact that bad galvanometers existed is not an objection to the use of the instrument. He had special reference to experimental work in regard to the physiological effects of electricity; for the therapeutic effects, the sensation of the patient is a sufficient guide.

Dr. MORTON wished to add a single point. Comparison had been made between the direction and the polar method to the disadvantage of the direction method.

With these criticisms he agreed. But it was also to be recollected that, according to the recent investigations, even with the polar method, we had to deal with an *actual* and a *virtual* electrode.

Thus, a new element of doubt was thrown into the polar method itself.

Dr. DANA, in closing the discussion, said, with reference to Dr. Mills' criticism, which he thought was proper, that he did not go into the entire subject of the physiology of the action of the current very extensively, because his object was to present a summary upon which to base the rationale of his treatment. He did not exactly understand, however, the point of the objection raised by Dr. Mills. If we put the positive pole upon the head, and the negative pole upon the foot, it seemed to him that it is easier to suppose that the effects are produced directly,

than it is to suppose that they are produced by the irritation through the cutaneous nerves, and that the irritation is transmitted in that manner. That there is a current passing into the brain he thought had been definitely settled, as we know there is hardly any substance which opposes the passage of the electrical current. He therefore supposed that the current traversed to a great extent the subcutaneous tissues, and that a certain amount must have passed through the cerebral tissues. The dura mater and meninges being moist could not be looked upon as an obstacle to the passage of the electrical current. In fact, as Erb says, the great thing to prevent electricity entering the body is the skin, and nothing but the skin, and that if it can be gotten through the skin, it can be carried to different viscera. As regards the theory that internal influences are concerned in the diffusion of electrical currents, Dr. Dana regarded it as disproved that the phenomena of cerebral galvanization are produced by reflexes, as proved by a careful analysis made by Lowenfeld. In regard to the galvanometer he did not use it; he had used it in connection with the treatment of some of his cases, but he could not say that it gave him any indication except that the battery was in good working order. In regard to the efficacy of electricity in chorea, mentioned by Dr. Weber, he did not state how it was given, and Dr. Dana regarded the method as a very important factor in the treatment. With regard to the objection to the polar method, perhaps it was well founded, but Dr. Dana confessed that he could not say very much about it; still he thought that we cannot say positively, any of us; we have to determine whether there is any error in it by actual experiments.

Dr. BURT G. WILDER, of Ithaca, then read a paper on "The removal and preservation of the human brain."

Assuming the great value of an accurate knowledge of the gross structure of the human brain as a foundation for histological research and for comparative anatomy and psychology, Prof. Wilder urged that in all museums, and in the private collections of medical men, and especially

teachers, there should be preparations of brains removed without the risk of tearing delicate parts, and perfectly preserved.

For the sake of obtaining such brains, no time, labor, or expense should be spared, and the other parts of the head should be sacrificed if necessary. The present is a preliminary account of methods which are now employed in the anatomical laboratory of Cornell University; the primary object is the making of reliable macroscopic preparations, and it is not certain that the method of hardening will answer for histological purposes. The efficacy of the methods employed was attested by preparations of brains, adult, young, and foetal, entire and dissected or in sections.

The leading points were as follows: 1. The use of "side-cutting nippers" for the removal of the skull of young subjects. 2. The retention of the dura until the calva is removed. 3. With adults, the longitudinal hemisection of the calva, $1\frac{1}{2}$ cm. to the right of the meson, before the circular incision is quite completed. 4. The use of round-pointed "shoe knives," curved and straight, for the separation of the calva from the dura, the smaller half of the calva being removed first. 5. The constant support of the brain by means of strong brine during its extraction, hemisection (if this is done), and removal to alcohol. 6. For the special study of the form and the arrangement of the fissures, the partial hardening of the brain within the skull by the *continuous* injection of alcohol (increasing at intervals of two or three days from sixty to ninety-five per cent.) into the arteries, and the subsequent hemisection of the organ, each half being allowed to harden while immersed in alcohol, and resting with its meson on a glass plate. 7. For the special study of the coelian (ventricular) connections and parietes, the reduction of the brain to a flat-sided mass containing the desired regions, and the *continuous* injection of alcohol through the foramen infundibuli or any artificial orifice. 8. Keeping the brain while hardening as cool as possible without freezing. In conclusion Prof. Wilder desired to make public acknowledgment of his indebtedness to his colleague, Prof. S. H. Gage, not only for cordial and

efficient co-operation, but for special and valuable suggestions as to washing out the blood by injecting a ten-per-cent. solution of chloral hydrate, the employment of the curved blade in separating the dura, and the use of vaseline for anointing stoppers, corks, and rubber rings, so as to prevent the escape of alcohol.

Dr. MILLS thought we were greatly indebted to Dr. Wilder for his remarks and suggestions with reference to this matter. Of course, the method which he suggests for cutting the skull away by an extra incision to one side of the longitudinal sinus is a good one, yet it seemed to him that we can accomplish the same result by sawing the skull according to the usual method, and then inserting a knife and following the line of incision carefully around, cutting the falx with care and separating the crista, and then making a careful dissection. He thought it important that the various objects in making the post-mortem examination should not be lost sight of. From a morphological standpoint there is no method better, perhaps; but as clinical physiologists, it is our duty to accomplish two or three objects. It is our duty to examine in a better manner, if possible, for lesions; and, in order to do this, it is necessary to have methods for examination, for not only the brain, but its membranes, as we pass along. The method of injecting with alcohol for the preservation of the brain, seemed to him to be an admirable one.

Dr. E. C. SPITZKA, of New York, said there was no question about the excellency of the methods described by Dr. Wilder when applied for merely gross anatomical purposes. But it frequently occurred that for pathological purposes post-mortem examinations were obtained with exceeding difficulty, and, perhaps, in their performance only very limited assistance could be obtained, and special care was necessary to protect the carpets and furniture, etc., and it would hardly be possible to carry Dr. Wilder's explicit directions into actual practice. There is a method by which he thought we can make a cerebral autopsy, combined with removal of the spinal cord, which covers all the exigencies of the case. Before speaking of that he would

say that Dr. Wilder's method of preserving the brain was absolutely unfit for histological and pathological purposes to neurologists.

The scalp is divided in the median line, beginning a little in front of the coronal suture and extending down the neck. If it is desired to remove the spinal cord, the incision is extended to the lumbo-sacral region. Two lateral flaps are formed in the head region, the soft parts being peeled from the dorsal aspect of the cervical vertebræ and the posterior half of the skull. A circular incision is made in the skull, behind the ears, and completely encircling it down to the foramen magnum, care being taken not to injure the connection between the articular processes of the atlas and the occipital condyles; the posterior half of the skull is removed exactly as the calvarium ordinarily is, by taps of a chisel; sometimes a *rongeur* forceps suffices to complete the division near the foramen magnum. The adhesion about the lateral sinus and torcular Herophili can be readily overcome by a home-made apparatus like the knife shown by Professor Wilder. The advantages of this method are: 1. That the spinal cord and brain can be demonstrated *in continuo*. 2. That the critical operation of lifting the hemispheres and gouging out or injuring the cerebellum in dividing the tentorium is obviated. 3. That the nerves and arachnoidal laminæ at the base may be divided without allowing the brain to drag by its own weight. These nerves are divided from behind, forward. As soon as the chiasm is divided, the skull is inclined a little, and the brain allowed to fall into the hands of the operator by its own weight, it being completely separated, except where the olfactory filaments pass through the ethmoid; but these yield readily, and I have gotten the olfactory bulb intact as often by this as the other method. The removal accomplished, the occipital segment is riveted back, and a stick of wood inserted in the spinal canal and extending to the cranial interior, restores the strength to the head support, impaired by the breaking up of part of the vertebral attachments.

Dr. WILDER said he had ventured to doubt whether his

method was adapted to microscopical work. At the same time, before giving up the alcohol, he should like to see a brain worked that had been hardened according to *his methods*. As to removing the pia, he had not been in the habit of doing so until the brain had been somewhat hardened. It can usually be done better then than at the time of extraction from the skull. If the brain is thoroughly hardened, he thought the pia could be removed at any time.

Dr. WILDER then read a paper, in part, "On Some Points in the Anatomy of the Human Brain."

Preparations and photographs were shown in evidence upon the following points:

Centrum ovale majus; as has been stated by Dalton, and here shown by sections of a brain hardened within the skull, the removal of the dorsal part of the hemispheres to the level of the callosum opens both procoeliæ (ventriculi laterales), and thus renders impossible the unbroken area commonly figured and described as "centrum majus."

Striæ longitudinales; these markings of the dorsum of the callosum are the result of the pressure of the anterior cerebral arteries.

Eminentia splenialis; this provisional name is given to a well-marked elevation in the post-cornu just dorsad of the cephalic end of the calcar (hippocampus minor); it coincides with the position of part of the splenium.

Crista fornicis; in a child's brain this body (first found in a cat's brain, and later in the sheep) is fairly distinct, but no trace appears in the adult well-preserved brain. According to Prof. Wilder's suggestion, that the crista marks the limit of the primitive terma (lamina terminalis), it may be temporary in man, although constant in the cat.

Vericulum; this name is given to the transverse band or brace upon the caudal (posterior) aspect of the columnæ fornicis, which supports the crista.

Commissura fornicis; this is the Latin equivalent of Reichert's designation of the thin mesal band between the two halves of the fornix. The name was formerly applied by Prof. Wilder to the part now called vericulum.

Lyra ; this is not a part, but a surface ; the ventral aspect of the fornices, including the splenium.

Terma ; the lamina terminalis of a child after the removal of the pia from its ectal (exterior) surface. It is so thin as to be easily torn in removing or handling the brain.

Rima ; contrary to descriptions, the rima (fissura cerebri transversa) in man, as in the cat and all other mammals examined, does not extend the whole length of the mediacornu ; the tip of the latter, therefore, is completely circumscribed by nervous matter for 10-17 mm.

Ripa ; this name was first given by Prof. Wilder to the sharp edge resulting from the tearing off of the endyma along the margins of the rima and in other parts ; it is very distinct in the human preparations exhibited.

Aula ; this, the space between the two portæ (foramina Monroi), is narrower proportionately in man than in the cat.

Porta ; the two "foramina Monroi" are most readily exposed upon a brain, into the cœliæ of which alcohol has been continuously injected, by removing the lateral part of the hemisphere, including the striatum, as in the preparation of a child's brain shown. The dorsal limit of each porta is, in man, as shown by Professor Wilder in the cat, formed by the reflection of the endyma upon the intruded portiplexus. The length of the human porta varies from 4.5 to 6 mm.

Plexuses ; the relations of the several portions of the plexuses to the cœlian parietes, and the probability that not all have the same nature and relations, cannot profitably be discussed in this abstract. The same may be said of the question as to how far and in what way the dorsal surface of the thalamus appears as part of the floor of the proccelia. In the cat and dog, according to Prof. Wilder's observations, the thalamus is wholly excluded ; in man, a part appears, but it is covered by the endyma, like that which forms the side of the diacœlia (ventriculus tertius), while the intervening ectocœlian (extra-ventricular) portion has no such covering

Dr. G. L. WALTON, of Boston, presented a paper entitled,

“Two Cases of Hysteria: 1. Hysterical hemianæsthesia in a man, following injury. 2. Hysterical anæsthesia of special sense, accompanying cutaneous hyperæsthesia.”

Both cases were under treatment in the Department for Diseases of the Nervous System at the Massachusetts General Hospital, and were kindly referred to Dr. Walton for investigation, by Dr. J. J. Putnam.

The first was interesting chiefly on account of its etiology. A fireman, with no history of nervous trouble, a robust, healthy man, fifty-five years of age, was thrown from his engine and struck violently upon the ground. He was rendered unconscious by the fall, was severely bruised over the right side, including the shoulder and hip. He soon recovered his consciousness, for some time afterward had but little use of his right arm and leg, and was confined to his bed for six weeks. Since that time he has suffered from a variety of nervous symptoms, including great pain in the back, loss of sexual desire, impairment of emotional control and power of concentration. Examination five months after the accident failed to reveal paralysis or atrophy of muscles, although the general strength of the right arm was impaired. All forms of sensation were lessened over the whole body, most marked in the right side, to the median line. There were disturbances of vision and hearing, and taste and smell were impaired. The symptom which was specially interesting was the typical hysterical hemianæsthesia.

The peculiar feature in the second case was the occurrence of anæsthesia of the special senses, combined with hyperæsthesia of the integument over the corresponding regions.

The patient was a Portuguese girl, sixteen years of age, and unmarried. No history of nervous trouble in her family could be elicited. She was always well until she came to this country, about one year ago, since which time menstruation, previously free and painless, has been scanty and painful, although regular. Four months ago her left breast began to be painful and tender, and the sensitiveness gradually increased and extended to the back, head,

and left arm. About three months ago she had an attack of unconsciousness, following fright, and it lasted two hours. No other distinct history of hysterical attack of any sort could be made out. Examination reveals extreme hyper-æsthesia on the left side, extending over the trunk, head, and arm, bounded sharply by the median line, etc.

Both cases yielded under the use of the magnet.

Dr. SPITZKA moved that other papers presented be considered as read by title, and that the Association adjourn.

Carried: and the President declared the Association adjourned, to meet at the call of the Council in 1884.